IRON TRADE REVIEW
Registered U. S. Patent Office
The Authority of Industry National and International

Vol. LXXV Cleveland, July 17, 1924 No. 3

Readjustment Near Completion

Iron and Steel Market Shows Signs of Returning Stability—Pig Iron, Coke and Scrap Appear at Turning Point—Operations Slightly Better—Steel Buying Still Sluggish and Under Check—More Prices Reduced

UNDERLYING conditions in iron and steel appear to be approaching the final stages of the recent process of readjustment. This is making for a better outlook for some revival of market activity in the near future. Developments this week point to such raw material markets as pig iron, scrap and coke being near or at the termination of long price declines and at the return of more stabilized business. Some fair buying is appearing in these materials. In finished steel, however, buyers are moving cautiously and while they are releasing some tonnage, the situation still shows an absence of the confidence essential to liberal activity. As a consequence, the change in the week to week bookings of the mills continues slight.

Sheet and tin mill wages will be 3 per cent lower in July and August as a result of the bimonthly examination of manufacturers' sales sheets. A strike of tin mill workers against a 20 per cent wage reduction by an independent mill at McKeesport, Pa. is of local character.

Finished steel prices are shifting with the tendency gradually lower. Makers of wire products beginning this week are quoting $1 per ton reduction and in cold-finished bars $2 per ton, the latter to conform to the recent cut in hot-rolled bars. Plates remain a weak spot in all sections. Some eastern buyers of structural shapes are reported to be receiving credit memoranda equivalent to additional price reductions.

Capacity Is Put On

Operations show a shade of betterment. Two blast furnaces have gone in in the Mahoning and Shenango valleys which has been offset by the cessation of another furnace at Chicago. A Cleveland steelworks has added two open hearth furnaces to its active list largely due to automobile company releases of suspended steel orders. Steelmaking operations at Pittsburgh are put at 40 to 50 per cent. The Carnegie Steel Co. is doing slightly better at 44 per cent. Mahoning Valley sheet mills are operating this week at 43 per cent.

Buoyancy in the market for iron and steel scrap has become more pronounced. Advances of 50 cents to $1 per ton are reported from practically all selling territories and consumers at Youngstown, Chicago, South Bethlehem, in northern Ohio and elsewhere have closed round tonnages at higher prices. At several points dealers are outbidding the works for tonnage.

Iron Market Turning

The pig iron market appears either to be definitely turning or to have reached its bottom point after a practically unbroken decline of twelve months. Chicago furnaces have advanced prices $1 above the recent minimum. On all sides producers are holding more firmly and are inclined to try out some advances. A number of middlemen are seeking to close tonnage. The largest inquiry for basic in months, 25,000 tons, for a Newport, Ky. steelmaker, has appeared at Pittsburgh. A sale of 7000 tons of foundry at Buffalo is the principal lot in a week of moderate buying. Birmingham reports sales of 100,000 tons at the last reduction.

Indian pig iron has been assuming greater importance as a competitor in the domestic market along the Atlantic Coast.. Sales of this iron have been running about 10,000 tons monthly and have been made largely in New York, Philadelphia and New England territory.

IRON TRADE REVIEW composite of fourteen leading iron and steel products almost is in balance this week. The average is $39.89 compared with $39.91 a week ago. This is on the basis of August, 1922.

Much Work Is Bid

After the slump of a week ago, building steel contracts show some recovery. Awards of the week total 13,792 tons and new inquiry 20,000 tons. Philadelphia territory has come to the front with the largest week in its history in structural steel negotiations, these aggregating 55,000 tons. Bids taken there this week include 25,000 tons for the Delaware river bridge approaches, 10,500 tons for subways, 9000 tons for the first unit of a new power station for the Philadelphia Electric Co., 6000 tons for an athletic club and some other jobs. Total June bookings in structural steel were the best since March and were approximately 171,600 tons or 66 per cent of shop capacity.

Oil country demands are keeping in good volume. From 5000 to 10,000 tons for storage tanks is in the market. The Gulf Refining Co. is reported to have placed with the leading maker, 500 miles of large pipe for an oil line in the Southwest.

Business Trend and Chart Section Page 153

The Reader's Page

Contents, July 17, 1924

MARKET SECTION

General Market Review 129
Domestic Market Report 131-143
Price Tables 132, 133, 180, 184, 186
Foreign Market Reports 145, 146
Iron League Refutes Charges 148
Yesterdays in American Industry 149
Editorials 150, 151
Business Trend Charts 153-156

ENGINEERING SECTION

Orange County Ironmaking—By E. C. Kreutzberg 157
Part I—District Was Principal Producer During Revolution.

Generating Power From Mercury—By W. L. R. Emmet 161

Roller Bearings Facilitate Speed—By D. E. Batesole 164

Large Uses of Steel in Small Ways—Phonograph Needles 167

Manufacturing and Heat Treating Alloy Steel—By Marcus A. Grossmann 168
Part I—Application of Alloy Steels and Manufacturing Methods.

GENERAL NEWS SECTION

Men of Industry 173
Here and There in Industry 175
Obituary 176
Machinery Market Report 177
Crane Awards and Inquiries 178
Business Changes 179
Construction and Enterprise 180, 182, 183
New Trade Publications 183

This Day and Age —and That!

A FAMOUS divine once gave the following advice to those who would retain courage and optimism: "Always look ahead; never back. Remember, Lot's wife looked back—and she was turned to salt." But, if we never were to look back we would not realize the progress we were making, and without such knowledge there would

When Orange County Was an Iron Center—Page 157

be less concern about the future. Glimpses of past events are interesting, not only by reason of the contrasts they offer, but because they show us how we are developing; they give us perspective on evolution. We are reminded of great men and how they achieved greatness; of problems and how they were solved; of the advance in science and industry. Iron Trade Review is selecting items from its files of 10, 20 and 30 years ago, and publishing them at the corresponding time each week. You will find humor and information in them, and a great deal to convince you that the business world is growing better.

Do You Know That—

A prominent steel official just returned from a trip to the Pacific coast says every time he asked for a trade paper they handed him IRON TRADE REVIEW.

Pig Iron Selling Still Fairly Active, With Prices Stabilizing—Brokers Seek Basic; One User Asks for 25,000 Tons

PITTSBURGH, July 15.—Pig iron prices appear to have reached bottom and the entire tone of the market is stronger. The tendency is upward, although higher figures are unsubstantiated by sales. The largest single inquiry for basic since the Steel corporation entered the open market last year and since buying by brokers late last year is that of the Andrews Steel Co., Newport, Ky., for 25,000 tons of basic, or 5000 tons monthly over the remainder of the year, starting in August. Several other basic inquiries are out from brokers, of a speculative character, for 5000, 6000, 8000 and 10,000 tons each. Brokers are offering to pay $18, but are meeting with indifference on the part of producers. Some makers now are quoting $20, cash with order. The open market figure still is $19, valley. One producer states emphatically its next sale will bring above $19.25, valley. Recent sales of bessemer tonnage brought $20, valley. One producer there is cleaning up its stockpile of 3000 tons. Another maker sold a single carload at $21, valley. The McConway, Torley Co. is in the market for 500 to 750 tons for delivery over the next three months. The Westinghouse Electric & Mfg. Co. wants 50 tons for prompt shipment. The United Engineering & Foundry Co. still is negotiating for 1000 tons or more. Foundry iron activity is confined to a few small lots. Some are bringing $19.50, valley, for No. 2; $20 for No. 2X and $20.50 to $21 for No. 1. The minimum quotation on No. 2 still is $19.

Prices Fail To Advance

Boston, July 15.—Pig iron sales in New England continue in encouraging volume. Prices have not developed expected strength, although they are not lower than the levels established earlier in the month. A textile machine manufacturer bought 3500 tons of No. IX iron (2.75 to 3.25 silicon), $19, Buffalo, which means less than $23.92, delivered. The Sullivan Machinery Co., Claremont, N. H., bought 300 tons, part No. 2X, (2.25 to 2.75 silicon), part No. 2 plain, (1.75 to 2.25, silicon), and part malleable, the prices all figuring close to $23, delivered. A Massachusetts manufacturer bought 400 tons and another Massachusetts manufacturer is in the market for 1000 tons. Several sales of 200 and 300-ton lots were closed in Connecticut during the week, and considerable inquiry is now before the trade from that state. A sale of several hundred tons of No. 1X at $20.75, eastern Pennsylvania or $24.40, delivered, is reported.

Indian Iron More of a Factor

New York, July 15.—Sales of pig iron in this territory during the past week did not exceed 5000 tons in the aggregate. Several new inquiries are out which involve a total of about 6000 tons. A number of inquiries have been withdrawn, the consumers saying they would not lose by waiting. Pig iron consumption appears to be on a minimum basis at present due to the usual summer lull. Prices are unchanged excepting that the firmer tone recently displayed at Buffalo has not been maintained. On Buffalo foundry the usual figure is $19, furnace, for the first two silicon grades and $19.50 for 2.75 to 3.25 silicon. However, $18.50 has not disappeared at Buffalo. On eastern foundry iron the market continues $20 to $20.50, furnace. Sales of Indian pig iron produced by the Indian Iron & Steel Co. and the Tata Iron & Steel Co. have become a factor of increasing importance. Current bookings of Indian pig iron are at the rate of around 9000 tons per month. This business is spread out all the way from Boston to Galveston, Texas, but most of it is in the New England, New York and Philadelphia territories. Prices obtained for the Indian iron do not represent any pronounced concessions under the domestic market.

Larger Sales at Buffalo

Buffalo, July 15.—Inquiry for pig iron has increased to between 15,000 and 20,000 tons. Sales showed a corresponding gain last week, being approximately 20,000 tons. The largest lot sold was one of around 7000 tons of foundry iron. Lots of 1000 and 1500 tons also were sold. Buffalo furnace operators declare none of this business was taken below $19, and that silicon differentials were obtained on most of the business. Inquiries include foundry, basic and malleable. A Depew user is in the market for 3000 to 6000 tons of basic and malleable. There is one 2000 to 3000-ton inquiry for foundry iron and two or three of 1000 to 1500 tons. The bulk of the former inquiry has been covered. Furnace operators say their stocks will be reduced much more rapidly than they expected at the beginning of this quarter. They say they are getting business at $19 and upwards, despite reports of lower prices quoted locally. The situation is tightening up with production at 30 per cent of the district's capacity, and with present inquiry and sales warranting a somewhat higher rate of operation.

Little Change in Market

Cleveland, July 15.—Low prices on pig iron apparently have not disappeared, regardless of the fact that large tonnages have been placed on furnace books in the last few weeks. While some makers are holding to $19, valley, for No. 2 foundry iron, sales have been made recently at $18.50 in outside territory. This price also has applied on business closed at Buffalo. There is strong competition in practically all the districts served by pig iron interests with headquarters here. For delivery in the 50-cent switching area of Cleveland, local makers continue to ask $20, furnace. This figure is the price at which most of the business was taken during the last week, involving several thousand tons. One interest booked 10,000 tons for melters nearby; another's sales for the week, for several furnaces widely located, ran considerably over this, while the total for all interests represented here was approximately 35,000 tons. This is substantially the same as in the preceding week. The sale of one 5000-ton lot to an Ohio melter is the largest. A valley steelworks took 300 tons of foundry iron in competition with Cleveland furnaces. A lake furnace interest is practically booked up for the third quarter on the basis of present output, while two others report that 75 per cent of their production is covered. Sales by one interest so far in July are much better than for all of June, although the business in that month was considered good. Others find their shipments are much better than in June. A release of a large tonnage for an automotive interest, that applied on second quarter tonnage was a feature of the week. Inquiries are pending for 33,000 tons of basic iron, but

only 2000 tons is for a consumer. The other two inquiries, one of 25,000 tons, and another of 6000 tons, are from brokers. It is understood that $18.50 is being quoted by some makers. No sales have been concluded during the week.

Railroad Buys Tonnage

Philadelphia, July 15.—Low phosphorus pig iron sales are somewhat better, and aggregate several thousand tons for the week, including some sales in the Pittsburgh district. Foundry sales are larger than is apparent on the surface, some business being closed quietly. On the whole the market is quiet. It is understood the Pennsylvania railroad bought a total of 6000 tons of iron on its recent inquiry for Altoona and may close for more. Basic is featureless. Prices are unchanged.

Chicago Market Firmer

Chicago, July 15.—Northern foundry and malleable pig iron prices are firmer and apparently are heading toward $20 minimum. While the bulk of the present business is going at $20, some is available at $19.50. Nothing under $20 is claimed to be available for last quarter. Furnaces are convinced that the market has turned and that it shortly will be established on a permanent $20 basis. Several implement makers are inquiring for the first time in months. The malleable and foundry iron melt has increased slightly. Most inquiries and sales are for 200 to 500 tons. The Mayville stack is the only merchant producer active in this district, but stocks at furnace yards are unusually heavy. The present radical curtailment of production is helping the market. The bottom of the southern market still is $18, Birmingham, for No. 2 but sales necessarily are light. Lake Superior charcoal iron is unchanged at $26, furnace.

Inquiries More Active

Cincinnati, July 15.—Pig iron inquiry here is picking up. Buying so far this month has been more active than during the same period in June. Most transactions are confined to car lots for prompt shipment. The largest sale reported in the past week was 500 tons of malleable iron, to the Marion Malleable Co., Marion, Ind. This order went to a Chicago furnace interest. The Lima Locomotive Works, Lima, O., is reported to have bought 1000 tons of foundry iron from a Cleveland furnace. It is doubtful if the aggregate of sales during the past week is greater than 1500 tons. The Hardwick Stove Co., Cleveland, Tenn., is inquiring for 1000 tons of southern iron, while the Muncie Malleable Co., Muncie, Ind., wants 1000 tons of malleable for third quarter. An inquiry for 500 tons of northern foundry iron for the Springfield, O., plant of the International Harvester Co., also is noted, while a Cincinnati foundry is negotiating for 400 tons of the same grade. While $19.50, Ironton, represents the prevailing market quotation on northern iron, at least one producer will shade that price 50 cents a ton. Southern iron is quoted at $18 to $19 Birmingham, with few sales at either quotation.

Market Slow; Prices Easier

St. Louis, July 15.—Demand for pig iron is lacking. Some sales have been made, but only where large price concessions were granted. The principal mills and foundries are taking on business at reduced prices, and not in volume sufficient to stimulate interest in raw materials. No. 2 southern iron, (silicon 1.75 to 2.25) is offered at $18, Birmingham, and this figure is being bettered by the interest applying combined river and rail rate. For northern iron $19, Chicago, can be done, and a small tonnage of resale was reported at $18. The leading local producer has lowered its quotation from $22.50 to $23 to $20 to $20.50, f.o.b. Granite City. One important selling agency claims to have been offered iron on a basis of $19.50, delivered in St. Louis. Actual sales reported total approximately 6500 tons. The St. Louis Coke & Iron Co. sold 3000 tons of car wheel iron to an east side melter, and 500 tons of the same material to another manufacturer in the district. A southern agency sold 400 tons, including 200 tons to a local job foundry. A Texas melter took 200 tons of charcoal iron, and a local machinery builder was reported to have closed on 250 tons. Inquiries have fallen off, the total being un-

(*Concluded on Page* 137)

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	July 16, 1924	June, 1924	Apr., 1924	July, 1923
PIG IRON				
Bessemer, valley del., Pitts.	$21.76	23.26	24.61	28.51
Basic, valley	19.00	20.00	21.70	25.15
Basic, eastern del., eastern Pa.	20.50	20.60	21.35	27.25
*No. 2 foundry, del. Pitts.	20.76	21.26	23.51	27.36
No. 2 foundry, Chicago	20.00	21.40	24.40	28.00
*Southern No. 2, Birmingham	18.00	20.00	22.20	25.00
*Southern Ohio, No. 2, Ironton	19.50	20.25	23.00	26.50
**No. 2X, Virginia furnace	24.50	25.50	25.50	27.25
**No. 2X, eastern, del. Phila.	21.76	21.76	23.73	28.00
Malleable, valley	19.00	19.75	22.20	25.50
Malleable, Chicago	20.00	21.40	24.40	28.00
Lake Superior charcoal, Chicago	29.04	29.04	29.04	36.60
Gray forge, val., del. Pittsburgh	20.26	20.76	23.51	27.01
Ferromanganese, del., Pitts.	112.29	112.29	112.29	122.79
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	40.00	40.00	42.10	42.50
Sheet bars, open-hearth, Pitts.	40.00	40.00	42.10	42.50
Billets, bessemer, Pittsburgh	38.00	38.00	40.00	42.50
Billets, open-hearth, Pittsburgh	38.00	38.00	40.00	42.50
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.15	2.20	2.30	2.40
Steel bars, Chicago	2.25	2.25	2.41	2.50
Steel bars, Philadelphia	2.47	2.52	2.57	2.72

	July 16, 1924	June, 1924	Apr., 1924	July, 1923
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia	$2.42	2.42	2.47	2.72
Iron bars, Chicago mills	2.20	2.24	2.36	2.55
Beams, Pittsburgh	2.15	2.20	2.35	2.50
Beams, Philadelphia	2.42	2.42	2.57	2.82
Beams, Chicago	2.25	2.38	2.51	2.60
Tank plates, Pittsburgh	2.15	2.15	2.35	2.50
Tank plates, Philadelphia	2.22	2.27	2.52	2.82
Tank plates, Chicago	2.25	2.38	2.51	2.60
Sheets, blk., No. 28, Pittsburgh	3.60	3.65	3.70	3.85
Sheets, blue anl., No. 10, Pitts.	2.75	2.80	2.80	3.00
Sheets, galv., No. 28, Pittsburgh	4.70	4.80	4.85	5.00
Wire nails, Pittsburgh	2.85	2.90	3.00	3.00
COKE				
Connellsville furnace, ovens	2.75	3.15	3.55	4.35
Connellsville foundry, ovens	4.00	4.15	4.60	5.15
OLD MATERIAL				
Heavy melting steel, Pittsburgh	17.50	16.25	16.60	18.25
Heavy melting steel, eastern Pa.	15.50	15.65	15.35	17.25
Heavy melting steel, Chicago	15.00	13.55	14.65	17.10
No. 1 wrought, eastern Pa.	18.25	17.75	18.40	18.85
No. 1 wrought, Chicago	14.75	13.25	14.80	16.60
Rails for rolling, Chicago	16.00	14.55	17.10	18.40

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago.

July 16, 1924	July 9, 1924	June, 1924	Apr., 1924	July, 1923	July, 1914
$39.89	$39.91	$40.61	$42.33	$45.39	$22.17

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

SCRAP PRICES, PAGE 184; WAREHOUSE, PAGE 180; ORE, NUTS, BOLTS AND RIVETS AN PIPE PRICES, PAGE 186

Pig Iron

Prices per gross ton

Bessemer, valley	$20.00 to 21.00
Bessemer, Pittsburgh	21.76 to 22.76
Basic, valley	19.00
Basic, Pittsburgh	20.76
Basic, Buffalo	19.00
Basic, del., eastern Pa.	20.50 to 20.75
Malleable, valley	19.00 to 19.50
Malleable, Pittsburgh	20.76 to 21.26
Malleable, Cleveland, del.	20.50
Malleable, Chicago	20.00
Malleable, Buffalo	19.00 to 20.00
Malleable, del., eastern Pa.	21.25 to 22.25

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	21.76 to 22.76
No. 1X, Buffalo	19.50 to 20.00
No. 1 foundry, Chicago	20.50
No. 2 foundry, valley	19.00 to 19.50
No. 2 foundry, Pittsburgh	20.76 to 21.26
No. 2 foundry, Buffalo	18.50 to 19.00
No. 2 foundry, Chicago	20.00
No. 2 foundry, Granite City	20.00 to 20.50
No. 2 foundry, Ironton fur.	19.50
No. 2 foundry, Cleveland, del.	20.50
No. 2 foundry, del., Phila.	20.76 to 21.76
No. 2 foundry, N. J. tidewater	21.39 to 22.39
No. 2X, eastern del., Phila.	21.26 to 22.26
No. 2X, east. N. J. tidewater	21.89 to 22.89
No. 2X, eastern del., Boston	23.65 to 24.15
No. 2X, foundry, Buffalo fur.	19.00 to 20.00
No. 2X, Buffalo, del. Boston	23.91 to 24.41
No. 2 southern, Birmingham	18.00 to 18.50
No. 2 southern, Cincinnati	22.05 to 22.55
No. 2 southern, Philadelphia	25.80 to 26.30
No. 2 southern, Chicago	24.01 to 24.51
No. 2 southern, Cleveland	24.01 to 24.51
No. 2 southern, Boston (rail and water)	24.91 to 25.41
No. 2 southern, St. Louis	23.17 to 23.67
No. 2X, Virginia furnace	24.50
No. 2X, Virginia, Phila.	29.17
No. 2X, Virginia, Jersey City	30.04
No. 2X, Virginia, Boston	30.41
Gray forge, eastern Pa.	20.50 to 21.50
Gray forge, val. del., Pitts.	20.26
Low phos., standard, valley	27.00 to 28.00
Low phos., standard, Phila.	nominal
Low phos., Lebanon, furnace	24.00 to 24.50
†Low phos., English, Phila.	27.26 to 27.76
Charcoal, Birmingham	31.00
Charcoal, Superior Chicago	29.04

Silvery Iron
Jackson County, Ohio, furnace

7 to 8 per cent	29.00
8 to 9 per cent	30.50
9 to 10 per cent	32.50
10 to 11 per cent	34.50
11 to 12 per cent	37.00
12 per cent	39.50

Bessemer Ferrosilicon
Jackson County, Ohio, furnnace

10 to 11 per cent	39.50
11 to 12 per cent	42.00
12 to 13 per cent	44.50

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	107.00 to 107.50
Ferromanganese delivered Pittsburgh	111.79 to 112.29
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	34.00 to 36.00
†Spiegeleisen, English, delivered tidewater	33.00 to 34.00
Ferrosilicon, 50 per cent contract freight allowed	72.00 to 75.00
Ferrotungsten standard, cents per pound contained	88.00 to 90.00
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, delivered	10.00 to 10.25
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	$3.25 to $3.75
Ferro carbon-titanium, carloads, producer's plant, per net ton	$200.00

†Duty paid.

Coke

Beehive, Ovens
Prices per net ton

Connellsville furnace	$2.75 to 3.00
Connellsville foundry	4.00 to 5.00
New river foundry	8.50 to 9.00
Wise county furnace	3.75 to 4.50
Wise county foundry	4.00 to 5.00
Alabama furnace	5.00 to 5.25
Alabma foundry	5.00 to 5.50

By-Product

Foundry, Newark, N. J., del.	$10.41
Foundry, Chicago, ovens	10.75
Foundry, Boston, delivered	12.00
Foundry, St. Louis	12.00
Foundry, Granite City, Ill.	9.00 to 9.50
Foundry, Alabama	5.50 to 5.75

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS
4 x 4-inch base

Open-hearth, Pittsburgh	$38.00
Open-hearth, Youngstown	38.00
Open-hearth, Philadelphia	43.17
Open-hearth, Chicago	35.00 to 38.00
Bessemer, Pittsburgh	38.00
Bessemer, Youngstown	38.00
Forging, Pittsburgh	43.00
Forging, Philadelphia	45.17 to 48.17

SHEET BARS

Open-hearth, Pittsburgh	$40.00
Open-hearth, Youngstown	40.00
Bessemer, Pittsburgh	40.00
Bessemer, Youngstown	40.00

SLABS

Pittsburgh	38.00
Youngstown	38.00

WIRE RODS
¼-inch and finer

Wire rods, Pittsburgh	$48.00

Standard extras, $2.50 per ton over @-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skedp, Pittsburgh	2.15c to 2.20c
Universal skedp, Pittsburgh	2.15c to 2.20c
Sheared skelp, Pittsburgh	2.15c to 2.20c

Shapes, Plates and Bars

Prices per pound

Structural shapes, Pittsburgh	2.15c to 2.20c
Structural shapes, Phila.	2.22c to 2.47c
Structural shapes, New York	2.24c to 2.49c
Structural shapes, Chicago	2.25c to 2.35c
Structural shapes, Birmingham	2.30c to 2.35c
Tank plates, Pittsburgh	2.15c to 2.20c
Tank plates, Philadelphia	2.12c to 2.32c
Tank plates, New York	2.14c to 2.34c
Tan plates, Chicago	2.25c to 2.35c
Tank plates, Birmingham	2.30c to 2.35c
Bars, soft steel, Pittsburgh	2.15c to 2.20c
Bars for cold finishing, Pitts.	2.30c to 2.35c
Bars, soft steel, Philadelphia	2.47c
Bars, soft steel New York.	2.49c
Bars, soft steel, Chicago	2.25c
Bars, soft steel, Birmingham	2.30c to 2.35c
Bars, refined iron, Pittsburgh	3.00c to 4.75c
Bars, rail steel, Chicago	2.10c to 2.13c
Bars, rail steel, mill	2.10c to 2.20c
Reinforcing bars, billet, Pitts.	2.15c to 2.20c
Bar iron, common, Phila.	2.42c
Bar iron, common, New York	2.44c
Bar iron, common, Chicago	2.20c
Bars, forging quality, Pitts.	2.40c to 2.45c

Hoops, Bands, Strip

Prices per pound

Hoops, Ptitsburgh, under 5 in	2.60c to 2.75c
Hoops, Pittsburgh, 20 gage, under 1 in.	2.90c to 3.00c
Bands, Pittsburgh	2.60c to 2.75c
Hot rolled strip steel, Pittsburgh stamping quality	2.50c to 2.75c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh	4.25c to 4.50c

Cold Finished Steel

Prices per pound

Cold finished steel bars, Pittsburgh base, carloads	2.80c
Cold-finished steel bars, base Pittsburgh, less carloads	2.90c to 3.15c
Steel shafting, Pittsburgh	2.80c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 32.50
Relaying rails, Pittsburgh	25.00 to 28.00
Light rails, 25 to 45, mill	1.90c to 2.00c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pitts.	2.80c to 2.90c
Spikes, small railroad, 7/16-in. and smaller	3.25c to 3.40c
Spikes, boat and barge, Pitts.	3.25c to 3.46c
Spikes, railroad, Chicago	3.10c
Track bolts, Pitts. standard	3.75c to 4.00c
Track bolts, Pitts., small	4.50c to 4.75c
Track bolts, Chicago	4.10c
Tie plates, Pittsburgh	2.50c to 2.55c
Ties plates, Chicago	2.60c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads
Prices per pound

Wire nails, Pittsburgh	2.85c
Galv'd nails, 1-inch and over	5.15c
Plain wire, Pittsburgh	2.60c
Annealed wire, Pittsburgh	2.75c
Galvanized wire, No. 9 gage, Pittsburgh	3.20c
Barbed wire, painted, Pitts.	3.35c
Barbed wire galv., Pitts.	3.60c
Polished staples, Pittsburgh	3.35c
Galvanized staples, Pittsburgh	3.60c
Coated nails, count keg Pittsburgh	2.30c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Sheets

SHEET MILL BLACK
Prices per pound

No. 28, open-hearth, Pitts.	3.50c to 3.65c
No. 28, bessemer, Pitts.	3.50c to 3.65c
No. 28, open-hearth, Phila.	3.82c to 3.97c
No. 28, open-hearth, Chicago.	4.09c to 4.19c

TIN MILL, BLACK

No. 28, open-hearth, Pitts.	3.75c

GALVANIZED

No. 28, open-hearth, Pitts.	4.70c to 4.80c
No. 28, bessemer, Pittsburgh	4.70c to 4.80c
No. 28, open-hearth, Phila.	4.97c to 5.12c
No. 28 open-hearth, Chicago	5.19c to 5.34c

BLUE ANNEALED

No. 10, open hearth, Pitts.	2.75c to 2.80c
No. 10, bessemer, Pittsburgh	2.75c to 2.80c
No. 10, open-hearth, Phila.	3.02c to 3.12c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22, Pittsburgh	5.10c

Tin Plate

Prices per 100-pound box

Tin plate, coke base, Pitts.	$5.50

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Chain, Piling, Cut Nails

Prices per pound

Chain, 1-in. proof coil, Pitts	6.00c to 6.25c
Sheet piling base, Pittsburgh	2.20c to 2.25c

Cotton ties, bundle 45 lbs. Pittsburgh, delivered prices on application or $1.40, Atlantic seaboard.

Cut nails, Pittsburgh	2.90c

Cast Iron Water Pipe

Prices per net ton
Class B Pipe

Four-inch, Chicago	$58.20 to 59.20
Six-inch and over, Chicago	52.20 to 54.20
Four-inch, Birmingham	51.00 to 52.00
Six-inch and over Birm'ham	47.00 to 48.00
Four-inch, New York	64.60 to 65.60
Six-inch and over, New York	59.60 to 60.60

Standard fittings, Birmingham, base, $110.00
6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.
Class A pipe is $5 higher than Class B.

Scrap Feels Upward Urge

Advances of 50 Cents and Upward Made in All Centers—Dealers Pay Higher To Ship on Contracts—Buying Would Bring Further Boost

SCRAP PRICES, PAGE 184

Chicago, July 15.—Iron and steel scrap prices continue bullish with increasing interest on the part of melters and dealers who more actively are bidding for material. A user has paid $15.50 for heavy melting steel and the market is now quoted at $15 to $15.50, but dealers are paying up to $16 for steel. The Chicago & Alton railroad was paid $16.15 for its steel a few days ago and a melter now would probably have to pay $16.50. The Chicago & Alton railroad received better than $18, Chicago, for malleable and $16, Chicago, for rerolling rails. Brokers have some distress rerolling rails they are willing to sell at $16. Sentiment is decidedly better and brokers are assembling tonnages at prices which indicate they foresee higher levels. The Rock Island railroad is offering 4000 tons of scrap, the Santa Fe 3800 and the Northern Pacific 1100 tons.

Demand for Heavy Steel

Boston, July 15.—Heavy melting steel is in slightly better demand in the New England market although prices still hover close to $10.50, shipping point. This level is necessary in order to meet the $16 delivered price in eastern Pennsylvania. Wrought iron pipe is in better demand with the price also held at $10.50. A few scattered orders for borings and turnings are reported but most sales of the past week have been for speculation among dealers. The present price is about $8 shipping point which is regarded by most authorities as a low figure. The cast grades still continue sluggish with prices slipping slightly but on the whole little changed. A sale of 200 tons of No. 1 machinery is reported at $17.75 delivered. Strictly textile scrap commands at least $19.50 and a few sales at $20 delivered are reported.

New York at Standstill

New York, July 15.—Quotations on iron and steel scrap are featured by a reduction in borings and turnings and a stronger tone in wrought pipe. The latter is attributable in a measure to an advance by a dealer of 50 cents a ton in obtaining wrought pipe to fill an order for 2000 tons, rather than in taking it from stock. The easier tendency in borings and turnings is said to be partly due to recent sales for shipment to Bethlehem, at $10, delivered. Consuming demand continues far from active, although it is reported that a sale of 10,000 tons of melting steel has recently been made for shipment to South Bethlehem. There appear to be no indications of an early revival.

Higher at Philadelphia

Philadelphia, July 15.—Some grades of iron and steel scrap are higher and the tone is generally strong. One mill has difficulty in buying heavy melting steel at $16, delivered. It is understood the Bethlehem Steel Co. bought steel recently at $14.50. This price appears to be due to the fact that Bethlehem rejects nothing but applies penalties to material not No. 1 when strictly that grade must be shipped. The minimum appears to be $16.

More Activity at Pittsburgh

Pittsburgh, July 15.—Recent activity in the Mahoning valley and Warren, O., territories, where large purchases of scrap have been recorded, has awakened interest here. The Youngstown Sheet & Tube Co. is credited with placing orders for a round tonnage including heavy melting steel, compressed sheets, and borings and turnings. The Trumbull Steel Co. has taken several thousand tons of heavy melting steel. Last Friday all quotations were withdrawn and since then higher levels have been quoted on several grades. One nearby melter who had been bidding $17 and had paid $17.25 for a small quantity of heavy melting steel, and who then withdrew from the market, will probably have to pay higher figures unless strength proves short-lived. Compressed sheets are up $1, to $16 to $16.50, machine shop turnings are up 50 cents, while shovel turnings have resumed at least part of their usual differential over machine shop turnings and are quoted at $14 to $14.50, the same as cast borings. The next sales of the latter grade will probably develop $1 higher figures since dealers are paying $14 to $14.50.

Buffalo Feels Strength

Buffalo, July 15.—Considerable fluctuation in iron and steel scrap prices is shown as dealers have endeavored to replenish stocks. Production of scrap has been small and only by advancing prices could dealers bring out holdings of most materials. There have been fluctuations of 50 cents to $1 a ton as dealers sought to establish new prices for third quarter buying. There is improved demand for heavy melting steel although no large tonnage has been purchased. One mill has ordered dealers to resume ship-

(*Concluded on Page* 143)

Steel Tonnage Released

Specifications Due To Better Sheet Demand Advances Operations of Some Makers of Semifinished—Lower Sheet Bar Prices Expected

SEMIFINISHED STEEL PRICES, PAGE 133

Pittsburgh, July 15.—Semifinished material inquiries show no positive signs of opening up, although here and there one for a nominal tonnage appears. One recent sheet bar inquiry for 800 tons from the Mahoning valley territory developed a price of $40, delivered; the general quotation is $40 base Pittsburgh or Youngstown. Some recent billet inquiries apparently for the purpose only of sounding out the market have been withdrawn. While a few producers, anxious to dispose of stock accumulations, have offered price concessions, the usual quotation of $38, Pittsburgh or Youngstown, prevails as a contract basis on rerolling billets to be produced. Forging billets are quoted at $43, but like other market quotations, this one is untested by various inquiries and possibly lower figures will be developed on the next large tonnage to be closed up. The Universal Steel Co., Bridgeville, Pa., is understood still to be negotiating for a few thousand tons of special analysis slabs. Quotations on slabs are the same as on rerolling billets. Wire rods are quotably unchanged at $48, Pittsburgh; some are moving on contracts but new transactions are scarce. Skelp is untested at 2.15c to 2.20c, base Pittsburgh.

Release Tonnage for Motor Cars

Cleveland, July 15.—Releases of steel tonnage by motor car builders has had a beneficial effect in the trade. The leading maker of semifinished material here has increased the number of its active open hearths from eight to 10, and now is producing at more than 80 per cent of its capacity. This is attributed to the improvement in demand from that source. The market so far as new tonnage is concerned continues dull, and while lower prices are reported, makers continue to quote $38, valley, on billets and slabs, and $40 on sheet bars.

Wire Rod Price Firm

New York, July 15.—Such irregularities as were reflected in wire rod prices a few weeks ago seemed to have disappeared entirely. The wire rod market is firm at $48, Pittsburgh.

Seek $38 On Sheet Bars

Youngstown, O., July 15.—Sales of semifinished material still are lacking owing to relative quiet conditions which exist in the sheet industry. Consumers found it impossible to take in all sheet bar tonnage under contract for second quarter. Consequently, no effort to line up third quarter sheet bars requirements is being undertaken at present, although a move in this direction likely will be made should conditions in the sheet market take a decided turn. While the sheet bar market remains untested at $40, Youngstown, the feeling prevails that when third quarter prices come up for discussion business will be closed on a somewhat lower basis. No price is mentioned in this connection but in view of recent offerings at $38, Pittsburgh, by one producer outside this district it is felt that this figure likely will be used as a wedge to get sheet bar prices in line with the black sheet market.

Billet Sales Small

Philadelphia, July 15.—Billet sales generally are small. The largest trans-

action in some time involves 500 tons of rerollers. The market is $38, Pittsburgh, on rerollers, and $40 to $43 on forging quality.

Warehouse Prices Steadier

WAREHOUSE PRICES, PAGE 180

Cleveland, July 15.—Prices of iron and steel products out of warehouses are being maintained at the levels of the past few weeks. Shading of $1 to $2 a ton on desirable business is more prevalent but no definite price reductions have been put into effect. Some dealers are not shading and are taking a fair tonnage at quoted levels. The volume of business is about on a par with that of June. Recovery is expected but is slow in materializing.

Mill Shutdowns Aid Warehouses

New York, July 15.—Local iron and steel warehouse interests assert that they have benefitted of late by the action of some of the steel companies in closing down various departments for repairs. Trading is still far from brisk, with shapes and bars in outstanding demand. Prices are unchanged.

Prices Are Firmer

Philadelphia, July 15.—Practically all warehouse business in this vicinity is being done at 3.10c, Pittsburgh, on plates, shapes and bars. The market seems firm at this figure.

Business Has Improved

Detroit, July 15.—Business in iron and steel warehouse circles thus far this month appears better than it was in same period of June. Tonnage sales are small, and dealers say they do not look for any decided movement for the next 30 days, although the improvement thus far noted has given rise to a feeling of cheerfulness in the trade. Prices are unchanged.

Strip Schedules Improve

STRIP PRICES, PAGE 133

Pittsburgh, July 15.—Hot and cold-rolled strip steel makers here have not been able to bring average operations much above 35 or 40 per cent. At best trading is spasmodic. Some business lately has been coming from automotive customers and other consuming lines show interest. Only a few contracts have been closed, due to producers' indifference toward soliciting such obligations. Cold strips are quoted firmly here at 4.50c, base Pittsburgh, although 4.25c has appeared further west. On hot strips, 2.60c is the minimum quotation in this vicinity, while on large quantities some producers in other sections have named as low as 2.50c.

Better Eastern Demand

New York, July 15.—Business in cold-rolled strip steel has shown considerable increase in this district in the past couple of weeks and a number of good-sized tonnages have been placed. In some instances there have been material concessions. On most of the tonnage the price is 4.50c base Pittsburgh.

Coke Needs Are Appearing

Blast Furnaces Give Indications of Negotiating for August Requirements—Low Prices Still Prevailing—Some Grades Weaken

COKE PRICES, PAGE 133

Pittsburgh, July 15.—A few blast furnaces ordinarily using Connellsville beehive coke, but consuming by-product coke this month, indicate that within a week or two they will open negotiations for their August needs. They may possibly cover for the remainder of the quarter. The Shenango Furnace Co. last Friday started up a furnace idle since June 27, using Midland by-product coke this month. The coke was bought at a price equivalent to $3, Connellsville. The Trumbull-Cliffs Furnace Co. is starting a stack, using its own by-product fuel. The Adrian Furnace Co. may buy soon for August. One eastern Pennsylvania producer of low phosphorus iron is negotiating. A southern Ohio furnace, understood to be protected only to Aug. 1, is expected to buy. The Allegheny Ore & Iron Co., Buena Vista, Va., is contemplating starting operations Aug. 1. Connellsville operators probably will be shut out from the last order because of a high freight rate. The contract price still is $3. The spot market is unchanged at $2.75 to $2.90. Several small lots involving five cars at a time were bought at $2.90. Inquiries for medium sulphur coke for smelting purposes arise occasionally. This grade is priced at approximately the same as standard furnace. The Union Smelting & Refining Co., Newark, N. J., bought 50 carloads at $2.90. Foundry coke demand is less, although one maker has reduced its spot price from $5 to $4.50 and has gathered in several pleasing orders. High grade spot fuel is quoted $4 to $4.50, and on contracts $4.50 to $5. Premium brands are $5.75 to $6. Off-grade fuel is below $4. Ligonier valley foundry coke is available at $3.50. Production in the week ended July 5 was 54,240 tons, compared with 61,810 tons in the week preceding, according to the *Connellsville Courier*.

New England Coke Lower

New York, July 15.—The two New England makers have reduced their prices on by-product foundry coke, and effective July 11 began quoting $11.50, delivered to most New England consuming points. This is a reduction of 50 cents from the previous figure. No change yet has been made in this territory and by-product foundry coke still is quoted at $10.41, delivered at Newark and other northern New Jersey points. On standard beehive foundry coke the usual minimum continues $4.50, Connellsville. The volume of business in the coke market generally is small.

Sales in Small Volume

Cincinnati, July 15.—Users of foundry coke are purchasing from hand-to-mouth and there has been considerably less than the usual covering for third quarter. Sales of beehive coke continue in small volume, demand being supplied throughout this territory by the by-product manufacturers. A little purchasing by industrial consumers, chiefly water gas interests, constitutes the main activity. Virtually no demand exists here for furnace coke. Prices are unchanged. New River foundry coke ranges from $8.50 to $9 ovens, while the Wise county grade is quoted at $4 to $5, ovens. Pocahontas coke continues weak and featureless. Stocks of coke on by-product yards are heavy, particularly domestic sizes. There has been no further curtailment of production in the New River or Wise county districts.

Foundries Well Stocked

St. Louis, July 15.—Purchasing of foundry coke continues on a hand-to-mouth basis, current requirements being supplied principally by the by-product makers. Demand for beehive coke is at a low ebb. Shipments from the East and South are the smallest for this season in years. A number of foundries which usually purchase at this time are finding that their stocks are carrying them further than anticipated, and in some instances will not have to be replenished for three to four months. Prices show an easier trend, but quotations continue stationary.

Southern Prices Weak

Birmingham, Ala., July 14.—Most curtailment in production of coke in the South is with the iron companies, only one independent company so far having reduced its make. Quotations again are showing weakness and $5.50 for the foundry grade appears as the average price. Furnace coke is offered at $5. Beehive fuel is down to $5.50. Little coke is being shipped out of the Birmingham district.

Wellman Stock Sought

Two offers for large blocks of shares of the Wellman-Seaver-Morgan Co., Cleveland, are reported to have been made by separate interests seeking control of the company. One offer has come through Frank A. Seiberling, president of the Seiberling Rubber Co., Akron., who heads a syndicate seeking an option until Sept. 25 on 13,000 shares of Wellman common at $30 a share. Another offer broader in scope than the Seiberling proposal is to be made by other interests, it is reported. This offer is expected to include both common and preferred stocks, at prices not divulged. The company's shares have scored active advances as a result of the negotiations.

Lower Rate At Chicago

Chicago, July 15.—Blowing out of another steel works stack brings the active list of the two leading steel makers in this district down to 12 out of a total of 30. Only one merchant pig iron stack in this district is now active. Steel ingot operations this week are down about 2 points, to 38 per cent, which is the lowest in many months.

Bar Upturn Seems Made

Automotive Consumers Indicate Larger Specifications in July—Price Well Established at 2.15c, Pittsburgh, for Best Lots

BAR PRICES, PAGE 133

Chicago, July 15.—The situation in soft steel bars would indicate the finished steel market is definitely headed toward recovery but has done little more than face-about. One maker claims last week's bookings of bars were the heaviest in six weeks. Large warehouse interests seem about to replenish stocks. The outlook is that automobile and accessory manufacturers will take more steel in July than in June. Against these favorable factors, steel ingot operations have declined several points and one more steelworks blast-furnace stack has been blown out. Rumors of price cutting still are heard and undoubtedly less than 2.25c, Chicago, is being done on attractive business. Consumers of finished steel are generally agreed that the market has turned, and show more interest in supplies, but have not yet backed up their sentiment with contracts. Some producers predict the increase in finished steel demand will be as sharp as its recent decrease. The general quotation on soft steel bars is 2.25c, Chicago, but this level has been shaded at least 10 cents per 100 pounds for specific business.

One bar iron interest who has been down several weeks will resume next Monday, with a fair backlog. The general quotation of 2.20c, Chicago, could be shaded by an attractive specification. Rail steel mills generally are on a 5-day week basis, with specifications scarce. The rail steel bar price continues 2.10c to 2.13c, Chicago.

New England Sales Improve

Boston, July 15.—The soft steel bar price is now firmly established at 2.15c Pittsburgh in the New England market, and it is possibly as a result of this that bar sales and bar inquiry are much improved. One seller reports sales of the past week as more than double those of the previous week. Inquiry for last quarter is appearing.

Believe Turn Upward Made

Pittsburgh, July 15.—More customers specified on their merchant steel bar contracts last week than the preceding week, and this week promises to sustain the improvement. Makers are encouraged over prospects and believe that if the turn upward has not already been made it will be in the near future. The market price seems to be settled at 2.15c, base Pittsburgh, although effort still is made here and there to obtain 2.20c on undesirable lots. Demand for refined iron still lags. The price continues at 3.00c, while 3.75c to 4.00c is quoted on muck bar iron for crucible tool steel use, and around 4.00c on double refined iron; 6.50c on engine bolt iron, and 8.00c on staybolt iron.

Buffalo Demand Light

Buffalo, July 15.—Demand for bars is confined to carloads and less. Sellers have quoted 2.15c, Pittsburgh, on desirable business and are seeking 2.20c on smaller lots. Not much third quarter business is in prospect.

Cold Finished Down $2

Pittsburgh, July 15.—Cold-finished steel bars have been reduced $2 per ton to 2.80c Pittsburgh, by leading producers to meet recent cutting. Specifications this month to date have been light. Consumers whose stocks are low, are buying in small lots as needed. The usual less-than-carload price is 2.90c to 3.15c, base Pittsburgh, although regular customers who ordinarily purchase larger lots are given the benefit of the carload price on any small quantity. The tonnage coming in is from diversified lines of manufacture and some from jobbers.

Demand Somewhat Improved

Philadelphia, July 15.—Demand for steel bars is improved somewhat although confined to small tonnages only. Prices are firm at 2.15c, Pittsburgh.

A Little Improvement Shown

Cleveland, July 15.—New inquiries and orders for steel bars are a little heavier but the change is of very modest extent. Buyers are less inclined to keep their purchases down to bare minimums, though they are not willing to obligate themselves very far ahead because they entertain an expectation of still lower prices. Some further releases by automobile companies have been received by makers of automobile supplies and parts in this territory. Steel bar prices are steady at 2.15c, Pittsburgh. In some instances this week buyers who had set out to shade this figure finally placed their business at the full price. The band market remains weak with 2.65c to 2.75c, Pittsburgh, quoted on ordinary sizes and around 2.50c on strip mill widths.

Buy Automotive Bands

HOOP PRICES, PAGE 133

Pittsburgh, July 15.—A few small lots of hoops and bands for automotive purposes have been ordered recently but the market is practically devoid of interest. The usual quotation is 2.75c, base Pittsburgh, but on some attractive business as low as 2.60c has appeared. Operations still are spasmodic, the average being no more than 35 or 40 per cent of capacity.

Nut, Bolt, Rivet Demand Growing Stronger

NUT AND BOLT PRICES, PAGE 186

Chicago, July 15.—Makers of bolts and nuts believe they see signs of impending buying by Detroit automobile interests although so far no actual orders have been forthcoming. With inventory time now closing, makers feel certain the low point of shipments has been passed. Competition for current business is keen and railroads have been offered wrought washers at $6 to $6.10 off, while small business has prompted a price of $5.75 to $6 off. Attractive business in large machine bolts can be done at 70 off, while small rivets have been quoted as low as 70, 10 and 5 off.

Real Life Is Lacking

Pittsburgh, July 15.—While nut, bolt and rivet orders and inquiries are slightly more numerous and there appears to be a greater measure of interest, the market lacks real life. Prices are subject to much shading. The usual basis for large machine bolt contracts is 60 and 20 off. Less-than-carload lots of rivets have been more numerous and inquiries for single carloads have been fairly plentiful. Some prices around 2.45c, base Pittsburgh, have appeared on carload lots of structural rivets, but the usual figure is 2.50c, and some makers claim they are only exchanging dollars. On small rivets as low as 75 off has appeared in Chicago; the usual discount is 70 and 10 off on 300 pounds or more, and 70 off on less than 300-pound lots.

Lower Prices

Reported on Ferromanganese But No Formal Cut Has Been Made

FERROALLOY PRICES, PAGE 133

New York, July 15.—Sales of ferromanganese during the past week probably did not exceed several hundred tons in the aggregate. It is reported that the price of $107.50 duty paid tidewater in some cases has been cut as much as $1 per ton. No change has been made in the quotation on English ferromanganese which continues $107.50 duty paid tidewater. English producers have made a cut of 10 shillings for continental business but there has been no revision of their American price, probably due to the slow demand here at this time.

Several hundred tons of spiegeleisen have been sold and the market on this metal is unchanged at $34 to $36 furnace for 20 per cent.

Automobile builders have been taking a little more alloy steel, this month, so that specifications against contracts for ferroalloys have been somewhat better in July than in June. Prices are unchanged through the list. The high speed steel trade demand for tungsten and vanadium remains almost at a standstill.

Betterment Is In Sight

Pittsburgh, July 15.—Some improvement is in sight in ferroalloys. Shipping instructions are becoming more numerous and consumers are taking in tonnage better. As yet, new inquiries are scarce and sales few. Last week an American producer sold but one single carload but obtained the full price, $107.50, seaboard base. An importer of English material likewise sold a carload at $107.50, Atlantic seaboard. The American Steel Foundries, Chicago, which recently inquired for 300 or 400 tons, did not order domestic material. Indian ferromanganese still is offered at $100, seaboard. This material is 76 to 80 per cent with a guaranteed minimum of 75 per cent manganese content. Some less-than-carload quantities of the English standard material have brought $122.50,

delivered this district. Spiegeleisen is down $1, to $33 to $35 for 19 to 21 per cent material, and to $32 to $34 on the 16 to 19 per cent grade. Inquiries are scarce and no sales have been recorded here lately. The Mesta Machine Co. recently closed on a single carload of 50 per cent ferrosilicon at $72, freight allowed, it is understood. The McConway & Torley Co. is buying three carloads today at a similar figure. Some sellers having contracts at $75, freight allowed, for the last half will not quote less on a spot basis. Only one small inquiry for ferrovanadium has recently arisen, on which $3.75 was quoted. Other ferrovanadium is quoted at $3.50. Ferrotungsten inquiries are scarce because of the low operations generally prevailing among the tool steel manufacturers.

Conditions Are Unchanged

Chicago, July 15.—Conditions in prices in the market for ferromanganese and spiegeleisen are unchanged although some reduction had been expected. One large inquiry for ferromanganese is current.

Pig Iron Still Active

(*Concluded from Page* 132)

der 1000. The largest single demand is for 250 tons for the Gardner Governor Co. of Quincy.

100,000 Tons Sold in South

Birmingham, Ala., July 14.—Activity in the pig iron market, following the reduction to $18 to $18.50, was short, although about 100,000 tons was said to have been sold in the movement. A plant at Louisville placed approximately 10,000 tons, distributed between four companies in this district. One furnace company expects to delay curtailment of production, but others are not so hopeful. The Woodward Iron Co. has cut wages except for common labor, 10 per cent. The margin between cost of production and the selling price has been so narrow that furnace interests have been dissatisfied. Several independent coal and coke companies have readjusted their scales. One large furnace interest prefers shutting down to cutting wages.

Replogle Steel May Buy Several Pipe Plants

New York, July 15.—That the Replogle Steel Co. is asking further steps in the acquisition of cast iron pipe manufacturing properties is indicated by reliable reports that it is negotiating for an option to buy the Donaldson Iron Co., Emaus, Pa. As in the case of the Warren Foundry & Pipe Co., upon which the Replogle interests have recently acquired an option, the Donaldson Iron Co. is an eastern company of many years standing. It is estimated that it has a normal capacity of about 150 tons daily, or around 50,000 tons a year.

Should these two properties be acquired, they would afford the Replogle interests an outlet for 450 tons of the pig iron production of its two blast furnaces at Wharton, N. J., which have a capacity of about 500 per day each. It is understood that plans for acquiring still further properties are contemplated.

Plate Tonnage Increases

Many Medium Size Orders Lead to Better Operating Schedules—Eastern Bookings Best in Months—Oil Country Demand Holds Up

PLATE PRICES, PAGE 133

Philadelphia, July 15.—Current plate bookings are better. Mills are producing at 45 to 75 per cent of finishing capacity. The largest prospect is the Richmond street station of the Philadelphia Electric Co., for which 4000 tons of carbon steel plates, or 1250 tons of silicon plates, 1800 tons of carbon plates, and 500 tons of slabs are required. The Baldwin Locomotive Works is expected to close on 900 tons of plates this week for 30 Seaboard locomotives. Several thousands are involved in oil tank inquiry. Prices are unchanged at 1.80c to 2.00c, Pittsburgh.

Total Demand Is Larger

New York, July 15.—Plate demand in this territory continues comprised almost entirely of tonnage for spot shipment, but the aggregate involved is greater than at any time for months. As a result, operations at eastern mills have increased. The finished production of the eastern mills now ranges from 40 per cent with some mills to 80 per cent with others. Current prices range from 1.80c to 2.00c, Pittsburgh, although the most attractive business is going at 1.85c to 1.90c. The Standard Oil Co. of New Jersey is understood to have postponed action indefinitely on a lot of 1700 tons of tank steel. The Lehigh Valley railroad has closed its third quarter requirements. Included in the current business are scattered tonnages for marine repairs and small ship construction.

Makers Accumulating Tonnage

Pittsburgh, July 15.—One large valley plate producer has accumulated sufficient business to run its plate department practically full during the present week and hopes before the week is out to gather enough to sustain operations next week on the same basis. Other plate makers are operating from 50 to 75 per cent of capacity. Small orders are fairly plentiful, especially for tank and boiler work. A few more oil storage tank inquiries still are before the trade and some barge business is being considered. The 2700 tons for the Standard Oil Co. oil storage tanks for Buffalo awarded last week to the Riter-Conley Co. probably will be furnished by the leading plate producer. Local sellers are maintaining 2.15c, base Pittsburgh, although much lower figures prevail in other sections, particularly the East and if Pittsburgh district producers want to share in that business they would have to meet competitive figures at and under 2.00c, base Pittsburgh.

Usual Orders Are Small

Cleveland, July 15.—Little new plate business apart from the usual miscellaneous run of orders has come out in this territory last week. One inquiry involving 500 to 600 tons of boiler steel is current but this is exceptional. Usually orders are small. Confirmation of the report that two of the several boats recently figured by lake yards have been placed, still is lacking. Pickands Mather & Co. is one of those interests in the market for a vessel taking prices on a self unloader. The Ford Motor Co. also has been talked of as a further buyer but whether it is actually negotiating, has not been established. Plate prices continue to show weakness. The price of 2.15c, Pittsburgh, is being shaded to a varied extent depending on the desirability of the particular business. Some tonnage went this week at 2.10c and it is reported 2.00c can be done on an especially attractive lot.

The Louisville & Nashville railroad, Cincinnati, is in the market for 500 tons of plates and sheets for third quarter delivery.

Oil Tank Demand Predominates

Chicago, July 15.—Barring the large item of 7000 tons for a riveted pipe line which the city of Denver is contemplating building, substantially the only plate demand is coming from the oil country. The Superior Oil Co. is inquiring for tanks requiring 1000 tons of plates, the Hooper Oil Co. 800 tons, and the Skelly Oil Co. 600 tons. The Magnolia Petroleum Co. has placed with the United Iron Works, Kansas City, tanks calling for 1500 tons of plates. Railroad car builders are not a factor at all in the plate market at present. Plates are the weakest of the finished steel products and while considerably less has been done, a range of 2.25c to 2.35c, Chicago, still describes the market for this district.

Wage Advance Demanded

Chicago, July 15.—Structural iron workers are following the lead of electricians, steamfitters, bricklayers and plasterers in demanding an increase over the $1.25 an hour rate supposed to govern the building trades until next May 1. Soon after May 1, bricklayers and plasterers demanded, and won, $1.37½ an hour. Then steamfitters and electricians were successful. Now the structural iron workers demand like treatment on the ground all building trade wages are to be on a level. In addition, the iron workers want $1.50 an hour after Nov. 1.

Incorporate Pipe Company

Clayton Mark & Co. is the corporate name under which Clayton and Anson Mark will operate the pipe mill which they are installing in a portion of the former Symington munitions plant at Seventy-fourth and Robey streets, Chicago. The capitalization is $1,500,000. In about two weeks officers will be chosen, while operations are scheduled to get under way in September. Offices of the company are 111 West Washington street, Chicago.

Concrete Market Steadier

Increased Buying Has Strengthening Effect Upon Quotations—Road Work Still Taking Good Aggregate of Reinforcing Bars

REINFORCING BAR PRICES, PAGE 133

Chicago, July 15.—Shipments of reinforcing concrete bars on small orders have been fair, in fact June shipments as a whole probably exceeded those of June, 1923, but the low price at which the larger jobs have been going is a discouraging factor. Most sellers have worked off business taken at 2.60c or higher and from now on will be shipping cheaper-priced bars. The work of estimating departments continues to taper off slightly, although there has been a fair run of small business. Reinforcing bar price weakness is not so pronounced because competition is less keen, but 2.35c, Chicago, still is the market.

Demand Unusually Dull

New York, July 15.—While lettings of reinforced concrete bars have been somewhat larger during the past week, demand generally continues quiet and is unseasonably dull. The largest tonnages in sight are those for the first unit of the Broad street subway, Philadelphia, and for the approaches for the Delaware River bridge at Delaware and Camden and action on these is expected before Aug. 1. The minimum on concrete bars for mill shipment appears to be 2.15c base Pittsburgh. On shipments out of warehouse here the market continues 2.90c to 3.00c base.

Building Awards All Small

Pittsburgh, July 15. — Building awards involving reinforcing concrete bars all are small this week and even in the aggregate are not importa Several good sized jobs are in prospect, including a few bridges, one or two school, bank and hotel buildings. Some additional road work has been placed involving in excess of 150 tons, the award going to the Concrete Steel Co. The market still is quoted at 2.15c to 2.20c, base Pittsburgh; 2.40c base Pittsburgh from warehouse.

Road Builders Lead Demand

Buffalo, July 15.—Road builders are the principal buyers of reinforcing bars. Contracts awarded within the past two weeks in western New York or about to be placed involve more than 600 tons of bars. The individu lots wanted range from 30 to 75 tons. Contractors are deferring purchases until the last moment in the hope of a price break. Prices are steady at 2.30c to 2.40c for bars from stock. There is little quoting on mill shipment material.

Many Small Projects Active

Cleveland, July 15.—Many small projects involving reinforcing concrete bars are active but large tonnages are few. One interest reports figuring three or four jobs requiring over 100 tons each. Others have plentiful small inquiries but few large ones. A good aggregate tonnage was booked in this district last week but no single project involved much steel. Prices on new steel bars are firmer, with 2.20c, Pittsburgh, a more representative market quotation. Only on attractive tonnages is 2.15c, Pittsburgh, now being named. Rail steel bars seem a little firmer. The open market is 2.00c to 2.10c, mill, though an attractive order still might bring out 1.90c. Dealers are figuring quotations on the basis of 2.40c, Pittsburgh, to 3.21c, Cleveland.

Price Competition Is Keener

Cincinnati, July 15.—Competitive conditions in the reinforcing concrete bar market are keener and increasingly low levels are revealed by recent successful bids. The 850-ton lot for the Cincinnati subway addition went to the Cambridge Steel Co., while the Ferro Concrete Construction Co, bought 1000 tons for stock filling purposes from the Jones & Laughlin Steel Corp. The general market on concrete bars is quoted at 2.20c Pittsburgh. The Pollak Steel Co., is quoting 2.10c, Marion base, on carbon steel bars.

CONCRETE CONTRACTS PLACED

Awards this week	8,822 tons
Awards last week	4,103 tons
Awards two weeks ago	3,580 tons

1000 tons, work contracted by Ferro Concrete Construction Co., Cincinnati, to Jones & Laughlin Steel Corp.

900 tons, Delaware River bridge anchorages, to Concrete Steel Co. Previously reported as involving 500 tons.

870 tons, subway addition, Cincinnati, O., to Cambridge Steel Co.

750 tons, new Hotel Duluth, Duluth, Minn., to American System of Reinforcing. Jacobson Bros., Columbia building, Duluth, general contractor.

700 tons, building for W. F. Hall Printing Co., Chicago, to American System of Reinforcing.

600 tons, road work in western New York, to several fabricators.

500 tons, bridge at Pittston, Pa., to Concrete Steel Co.

500 tons, Atlantic warehouse, Detroit, to Bourne-Fuller Co.

303 tons, Evening Herald building, Georgia and Pico streets, Los Angeles, general contract to Robt. E. Millsap, steel to Truscon Steel Co.

300 tons, Standard Sanitary Mfg. Co., Milwaukee plant, to American System of Reinforcing. W. W. Oeflein Inc., Milwaukee, general contractor.

300 tons, building for Hardwick & Magee Co., Philadelphia to Kalman Steel Co.

254 tons, harbor commission, Los Angeles, to Geo. L. Eastman Co.

250 tons, public schoolhouses, Milwaukee, to Concrete Steel Co.

235 tons, warehouse for Neptune Meter Co., Third and Alameda streets, Los Angeles, W. J. Saunders, 227 Laughlin building, architect, to Geo. L. Eastman Co.

225 tons, completion of Security apartments, Los Angeles, Wm. Simpson, general contractor, steel to Geo. L. Eastman Co.

220 tons, Atlantic warehouse, Paterson, N. J., to Pittsburgh Crucible Steel Co.

200 tons, Green avenue sewer, Brooklyn, N. Y., to Concrete Steel Co.

200 tons, school at Reading, Pa., to American Steel Engineering Co.

175 tons, outfall sewer, Los Angeles; general contractors Chas. & Geo. K. Thompson, steel to Geo. L. Eastman Co

125 tons, building for the Henkey Baking Co., McKees Rocks, Pa.; to Concrete Steel Co., through Henry Bussey, general contractor.

150 tons, Pennsylvania state road work, to the Concrete Steel Co.

140 tons, filtration plant in unnamed city, to Concrete Steel Co.

125 tons, Wilson school, Wauwatosa, Wis., to Truscon Steel Co.

CONCRETE CONTRACTS PENDING

700 tons, Twenty-third street viaduct, Chicago, for South Park commissioners; bids in

330 tons, Pacific Electric tunnel, Los Angeles, Twohy Bros. general contractors, steel not yet placed.

300 tons, Ohio Bell Telephone Co. building at Akron, O.; Carmichael Construction Co. awarded general contract.

230 tons, loft building, Seventh and Los Angeles streets, Los Angeles; bids in.

200 tons, Pennsylvania viaduct, Philadelphia; pending.

195 tons, hospital building for Naval Operating Base, San Diego, Cal.; general contract to Robt. E. McKee, Commonwealth building, San Diego, steel not yet placed.

150 tons, building for the Caskey Baking Co., Martinsburg, W. Va.; matter in abeyance.

140 tons, San Rafael high school, San Rafael, Cal.; bids in.

100 tons, Homewood State Bank, Homewood, Ill.; plans by Emil Liska, 35 South Dearborn street, Chicago; bids in.

100 tons, Garfield high school, Akron, O.; M. M. Konarski, architect; bids in July 22.

Tonnage unstated, reconstruction of 12-story Meyer Bros. Clothing Co. building at Springfield, Ill.; bids in August. Alfred S. Alschuler, 26 East Jackson street, Chicago.

Tonnage unstated, floor for bridge No. 27, Miles road, Springfield township, Hamilton County office, Cincinnati, O.; bids in noon July 17.

Tonnage unstated, building for Schwind Realty Co., North Main street, Dayton, O.; pending. Schenck & Williams are architects.

Tonnage unstated, 8-story hotel for R. Lorenzand at 4932 Lake Park avenue, Chicago; plans by S. S. Beman, 108 South LaSalle street, Chicago.

Tonnage unstated. 12-story hotel at Cleveland avenue and Third street, Canton, O.; the Stark Hotel Co., builder.

Award 500-Mile

Pipe Line in Southwest—Miscellaneous Demand Good—Cast Grade Firm

PIPE PRICES, PAGE 133 AND 186

Pittsburgh, July 15.—Miscellaneous pipe orders continue to come into the various makers here although it is not as yet possible to increase pipe furnace or pipe finishing department operations. These still average about 60 per cent of capacity, one or two producers maintaining schedules slightly in advance of 70 per cent. Large line pipe orders are scarce, although it is understood that the Gulf Refining Co. has placed with the leading maker a 500-mile line for southwestern installation. Several other large propositions still are pending in the East. Jobber orders are fairly numerous for small amounts. Mill prices are firm and some of the jobbers are silent concerning their recent prophecies indicating price declines. Standard full-weight merchant pipe jobbers are ordering from time to time as needed or as their stocks become depleted or unbalanced. Oil country jobbers' orders are few, due to curtailed drilling operations in various oil fields.

Bookings Somewhat Heavier

Chicago, July 15.—One of the larger cast iron pipe makers has increased its bookings almost two weeks in the past month. This accumulated business has been largely in the smaller sizes. Competition for the larger-size business still is sharp. Public service buying has been light recently but municipalities have been fairly active. The range on 4-inch pipe at Chicago now is $58.20 to $59.20, while $52.20 to $54.20, Chicago, still describes the market on 6-inch pipe and larger.

Municipal Inquiry Revived

New York, July 15.—The first municipal inquiry for cast iron pipe to appear in this district in some time

involves 100 tons of 20-inch pipe and 20 tons of fittings for the local water department. General contractors' bids for furnishing and laying the pipe will be closed July 18. While private inquiry is holding up fairly well, business undoubtedly is slowing up, and although prices are virtually unchanged, they undoubtedly are not as strong as they were. In some quarters a revision of prices would not prove unexpected. Pipemakers generally, it is understood, are able to make deliveries on most sizes before Sept. 1.

Municipality Again Buying

Cleveland, July 15.—Buying of cast iron pipe again has been done by the local municipality for waterworks extensions. Approximately 1000 tons was purchased in the last two weeks. Bids are being taken with no date set for closing, for 1600 tons of 36, 16 and 12-inch pipe for mains. A. D. Ruggles, commissioner of water, is taking bids. Small size pipe is not in demand by the city, no projects being contemplated for the next month. Filtration equipment is being purchased for the reservoir now under construction.

Pipe Making Active.

Birmingham, Ala., July 14.—Pipe makers of the Birmingham district have bookings warranting steady operation of plants. There has been but little slacking in operations. Lettings for pipe have been better lately and shipments are equal to the make. Recent readjustment of pipe prices did not have all the effect on the recent turn for the better. Winter buying so as to distribute the delivery of pipe over the year again is expected.

CAST IRON PIPE PLACED

526 tons, 16-inch, for Memphis avenue water mains, Cleveland waterworks department, to United States Cast Iron Pipe & Foundry Co., through David Lowensohn, general contractor.

447 tons, 36-inch, 12-foot sections, for section two, Ridge road, waterworks mains, Cleveland, to United States Cast Iron Pipe & Foundry Co., through Kalill & Jackson, general contractors.

400 tons, Winthrop Harbor, Ill., to United States Cast Iron Pipe & Foundry Co.

183 tons, Butler, Pa., to James B. Clow & Sons.

144 tons, Grand Trunk railroad, to James B. Clow & Sons.

100 tons, fittings for Chicago, to National Cast Iron Pipe Co.

CAST IRON PIPE PENDING

125,000 feet, 6 and 16-inch, for public works commission, Buffalo, N. Y.; pending.

1580 tons, 1500 tons, 36-inch; 76 tons, 16-inch and 4 tons, 12-inch, Ridge road sections one and three, Cleveland; A. D. Ruggles, commissioner of water, taking bids. No date set for closing.

Tonnage unstated, 10-inch mains, by Burlington Junction, Mo.; pending.

Ores Dominate Imports

Philadelphia, July 15.—Iron and manganese ore predominated in imports at the port of Philadelphia during the week ending July 12. The imports were as follows: Iron ore from Germany, 820 tons and from French Africa 7659 tons; manganese ore from Turkey and Europe, 7234 tons; scrap steel from England 21 tons; steel bars from Sweden, five tons; steel billets from Sweden, 27 tons; rolled iron from Sweden, 48 tons; steel sheets from Canada, 38 tons.

Sheet Market Is Brighter

Ordering Rate Better Than in Weeks, and Inquiries Show Broadening Tendency—Jobbing Trade and Motorcar Builders More Active

SHEET PRICES, PAGE 133

Pittsburgh, July 15.—Sheetmakers are slightly more encouraged than they have had reason to be of late because their customers are ordering in various grades of sheets at a better rate than in several weeks. The movement is not sufficiently voluminous as yet to indicate a permanent recovery but the outlook at least is brighter than it was. Operations were not increased perceptibly last week but it is confidently expected that schedules will be improved by the end of the present week. Last week's average was no higher than 35 per cent of capacity. Price ideas of various makers still are at variance. Some small independent producers still are willing to offer concessions down to 3.50c, base Pittsburgh, on black, although the usual cut price is 3.60c or $1 per ton under the 3.65c figure of the American Sheet & Tin Plate Co. and the majority of independent makers. On galvanized sheets the leading interest's price is 4.80c which also is the level maintained by some independents; others will go as low as 4.70c. Blue annealed is quoted at 2.75c to 2.80c, base Pittsburgh, but full finished steel is quoted at the flat price of 5.10c, that figure being observed generally. An occasional jobber's order is received. The movement of sheets from jobbers' stocks lately has been large, many orders going to jobbers for less-than-carload lots as substitutes for larger orders ordinarily placed directly with the mills. Some recent sheet orders for export have been of good size.

On business outside this territory three mills in one instance quoted 3.50c on black sheets. One mill quoted 3.35c and two mills quoted 2.65c on blue annealed. Automobile seconds were sold under 3.00c.

Sheet Prices Are Soft

Boston, July 15.—While prices for sheets are soft, sales in the past week show a fair improvement, and this is regarded as a decidedly favorable sign. No. 28 galvanized has been offered at 4.60c, Pittsburgh, while black sheets have dropped to 3.50c, Pittsburgh.

Tone of Market Is Better

Youngstown, O., July 15.—Conditions in the sheet market in this district show a slight improvement. Inquiry is on a broader scale, and the size of individual orders is larger. Inquiry is coming from widely scattered districts. The jobbing trade is beginning to show more interest. It is hoped that during the next 60 days sheet mill operations will be on a higher basis. This week, 43 per cent of capacity is engaged. Black tonnage has been placed as low as 3.50c, Pittsburgh. Indications are that certain makers of auto body sheets accepted this price to secure fill-in tonnage. Generally the black sheet market is quotable at 3.60c, Pittsburgh, although the range of 3.60c to 3.75c still exists. Blue annealed is reported firm at 2.80c, Pittsburgh. The minimum on galvanized is 4.60c, Pittsburgh. All mills will meet competition on this basis. Some producers are naming 4.65c as their lowest price on this grade. The galvanized market generally is quotable from 4.60c to 4.75c, Pittsburgh. There is a fair demand for spot shipment. Reports from Detroit indicate a change in the attitude of consumers of high-grade sheets. While orders for third quarter tonnage are not large more releases of held-up tonnage are noted. Mills catering to the automotive trade look for a buying movement to start within the next 30 to 60 days.

Prices Show Stiffening Tendency

Chicago, July 15.—Now that makers of steel sheets have their June costs before them they are not so precipitate in going below 4.80c, Pittsburgh, on galvanized sheets, 3.65c on black an 2.80c on blue annealed. Consumers are finding their stock lines badly broken and increased buying is prompted by this condition. Bookings of sheets of all grades have been increasing slowly and makers are certain the corner has been turned. There is a dearth of wasters and seconds.

Some Mills Offer Concessions

Philadelphia, July 15.—The general market for sheets is unchanged, but the desire for tonnage is inducing mills in some instances to offer to shade the market materially.

Specify Tin Plate

For September Requirements—Mill Operations Are Larger

TIN PLATE PRICES, PAGE 133

Pittsburgh, July 15.—September specifications are due on tin plate this week from container manufacturers and some already have been received. A few of these requirements had been anticipated by the producers and are ready for shipment if they have not already gone forward. Open market demand for production plate continues exceedingly limited and there practically is no call at all for stock plate. The latter is unchanged at $5.15, base Pittsburgh, the former being firm at $5.50 per base box, 100 pounds Pittsburgh. Tin plate operations last week were on the basis of about 50 or 52 per cent of capacity but this week they will be higher, with the starting up of mills idle since the early July and holiday shutdown.

Prices Firm; Sales More Frequent

Youngstown, O., July 15.—The bulk of the tin plate tonnage coming off the mills in this district is for immediate shipment to fabricators of tin cans which serve the packing trade. Prices are reported firm at $5.50, per base box, for production plates and $5.15, per base box, on stock items. Recent sales while more frequent show no increase from the standpoint of tonnage. The leading producer has sufficient business in hand to maintain operation at about 65 per cent.

Shape Awards Recover

Placing of Larger Projects Brings Market Out of Inactivity of Preceding Week—Prices Stabilizing at Recent Levels—June Awards Gain

STRUCTURAL SHAPE PRICES, PAGE 133

Washington, June 17.—Total estimated bookings of structural shapes in June amounting to 171,600 were the largest since March, and showed a distinct gain over the 153,400 tons booked in May. Operations were at 66 per cent of capacity in June as compared with 59 per cent in May and 65 per cent in April. Shipments in June were estimated at 202,800 tons, or 78 per cent of the country's capacity. This compares with estimated total shipments in May of 184,600 tons or 71 per cent of capacity.

The table below lists statistics reported by 184 identical companies, including data in earlier months for seven now out of business, with a present capacity of 240,945 tons per month, compared with 244,345 tons in 1923 and 237,415 tons in 1922. For comparative purposes the percentage figures are prorated to obtain an estimated total for the United States based on a capacity of 250,000 tons per month for 1922 and 260,000 tons per month in 1923 and 1924.

	Actual bookings tons	Per cent of capacity	Estimated total bookings
January, 1923.	177,346	73	189,800
February	190,262	78	202,800
March	227,114	93	241,800
April	191,742	78	202,800
May	138,576	57	148,200
June	123,351	50	130,000
July	123,266	50	130,000
August	140,768	58	150,800
September	127,612	52	135,200
October	118,989	49	127,400
November	130,218	54	140,400
December	192,762	80	208,000
January, 1924.	170,354	71	184,600
February	175,813	73	189,800
March	168,144	70	182,000
April	158,326‡	65	169,000
May	145,339*	59	153,400
June	156,575†	66	171,600

†Reported by 161 companies with a capacity of 237,396 tons.

‡Reported by 164 firms with a capacity of 232,295 tons.

*Reported by 186 companies with a capacity of 244,665 tons.

Building Slows Down

Boston, July 15.—The attempt of leading steel producers to stabilize structural prices at 2.15c, base Pittsburgh, in effect has been an advance in the local market. Consumers lacking confidence in the new prices have been hesitating about buying during the past week. Sales are reported from 20 to 40 per cent under the sales of the previous week. New contract work also has declined and the whole market is marking time, although several sizable projects are in the air.

Negotiates Record Tonnage

Philadelphia, July 15.—The biggest week in local structural history, from the standpoint of tonnage actively figured, is expected here. Approximately 55,000 tons is involved. Included in that figure is 10,500 tons for the first unit of the Broad street subway, bids on which opened today, 25,000 tons for the approaches of the Delaware river bridge, on which bids are to be opened July 16, and 6000 tons for the Penn Athletic club, quotations on which now are being tabulated. For an apartment 3000 tons at Nineteenth and Rittenhouse streets, also is active. Most of the tonnage in these projects is expected to be placed this week. The Philadelphia Electric Co. is taking bids on the Richmond power station, the first unit of which will involve 9000 tons, 3000 tons of which will be carbon steel and 6000 tons silicon steel. This tonnage includes 5000 tons of shapes and 4000 tons of plates. Plain material prices range from 1.90c to 2.15c, Pittsburgh. It is understood that some consumers consistently are receiving credit memoranda equivalent to price rebates.

Fresh Inquiry Light

New York, July 15.—Fresh inquiry continues light, but a fairly good amount of structural business is being booked. Included in recent large orders are 2000 tons for the teachers' training school and 1300 tons for an addition to the department store of Bloomingdale Bros. A feature is an improvement in railroad inquiry, although comprised chiefly of small items. The shape market, if anything, appears easier. The general range of plain shape buying appears to be between 2.10c to 2.20c, Pittsburgh, but concessions on sizable tonnage are being offered more freely.

Successive Small Jobs Taken

Pittsburgh, July 15.—Local fabricators report a succession of small jobs, each taking a less-than-carload quantity of structural shapes. The mill price has firmed up considerably on the basis of 2.15c, Pittsburgh and nothing less than that is available as a quotation in this vicinity. Some undesirable lots are quoted at 2.20c, base Pittsburgh. The 700 tons for a large hotel at Martinsburg, W. Va., which proposition was revived this week, was awarded about a year ago to the Jones & Laughlin Steel Corp. After the foundations for the hotel were in and the steel ready to fabricate, the project was held up pending completion of financial arrangements. This now has been accomplished according to the backers but it means practically no new steel business. Several verbal contracts for various jobs have been placed this week mosty originating at a distance from Pittsburgh and the formal contracts will be reported next week. Locally, building activity is exceedingly limited.

American Bridge Co. Low Bidder

Chicago, July 15.—The American Bridge Co. is low bidder for the 5000 tons of structurals in the Union League club project in Chicago, which it is stated will go ahead immediately. Probably several thousand tons are involved in the Standard club, Chicago, upon which Albert Kahn, Detroit, now is taking bids. Other awards and new jobs have been small. Although the run of small business in plain material still is done at 2.35c and this level is a little firmer if anything, the more attractive jobs and competition outside of Chicago proper warrant continuation of the range of 2.25c to 2.35c, Chicago.

Buying Still Restricted

Cincinnati, July 15.—Buying of structural shapes in this district still is restricted to small lots for quick shipment. The volume of business is small but prices are unchanged. More new inquiry is coming out but mainly for small tonnage lots. The Big Four railroad is inquiring for 250 tons for grade crossing purposes at Indianapolis, Ind.

Award 2550-Ton Lot

Cleveland, July 15.—Award of 2550 tons of structural shapes for the Cleveland Electric Illuminating Co. steam power plant to the American Bridge Co. was the feature of that market last week. Few other projects of any tonnage were closed. Fort Pitt Bridge Works has awarded 135 tons for the Cleveland Worm & Gear Co. plant. Inquiries were fairly numerous but were confined to small tonnage lots. Prices are steady at 2.15c, Pittsburgh, for plain material. Several large jobs are being figured, but these still are in the projective stage.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 13,792 tons
Building awards last week..... 9,749 tons
Building awards two weeks ago ... 25,425 tons

2550 tons, plant for Cleveland Electric Illuminating Co., Cleveland, to American Bridge Co.

2000 tons, Teachers Training school, New York, to the Hedden Iron Construction Co.

1500 tons, oil storage tanks for the Magnolia Petroleum Co., to the United Iron Works.

1300 tons, store addition for Bloomingdale Bros., New York to unnamed fabricator.

1200 tons, highway bridge over the Charles river, Boston, to the Boston Bridge Works.

1000 tons, school No. 173, New York, to Hinkle Iron Co.

600 tons, 150 x 300-foot fabricating plant for Reeves Mfg. Co., Dover, O., to the Alliance Structural Co.

600 tons, Whitehill building, Indianapolis, to the Rochester Bridge Co.

560 tons, shapes and 95 tons machinery, Montlake bridge, Seattle, Wash., to Wallace Equipment Co.

500 tons, tunnel work for the Public Service Corp., New York, to the American Bridge Co.

400 tons, substation for New York Edison Co., Twenty-second street, New York, to Hedden Iron Construction Co.

367 tons, Wabash railroad grade crossing elimination work, Detroit, to American Bridge Co.

300 tons, theater at 149th street and Third avenue, New York, to A. E. Norton, Inc.

280 tons, cast and ladle house for International Harvester Co., South Chicago, Ill., to American Bridge Co.

250 tons, hospital, Mt. Vernon, N. Y., to the the American Bridge Co.

230 tons, apartment on Broadway near Laguna street, San Francisco, Fred W. Quandt, architect, Humboldt Bank building, steel awarded to Moore Dry Dock Co.

225 tons, plant addition for the Westinghouse Electric & Mfg. Co., Springfield, Mass., to a local fabricator.

225 tons, motor repair shop for the Long Island railroad, to the Shoemaker Bridge Co.

200 tons, building at Perth Amboy, N. J., to Belmont Iron Works.

200 tons, bridgework for the Erie railroad, to American Bridge Co.

168 tons, bridges for Minnesota highway department, to American Bridge Co.

135 tons, plant for the Cleveland Worm & Gear Co., Cleveland, to Fort Pitt Bridge Works, through H. K. Ferguson Co., that city, engineer and architect.

102 tons, bridge for Rock Island railroad, to the McClintic-Marshall Co.

100 tons, building for Trico Products Co., Buffalo, N. Y., to unnamed fabricator.

100 tons, plates, pontoon work for Montlake bridge, Seattle, to Hydraulic Supply Mfg. Co.

100 tons, five small export buildings for the Standard Oil Co., to unnamed fabricator.

100 tons, car shop for Northern Refrigerator

Car Co., Cudahy, Wis., to Worden-Allen Co.

100 tons, plant for Olds Envelope Co., Baltimore, to Massillon Bridge & Structural Co., through H. K. Ferguson Co., Cleveland, engineer.

Tonnage unstated, one building for Ohio Portland Cement Co., Dayton, to the Bellefontaine Bridge & Steel Co. Five buildings, eight silos and three kilns are yet to be awarded.

Tonnage unstated, garage for Lake Erie Provision Co., Clark avenue and the Big Four railroad, Cleveland, to the Forest City Steel & Iron Co.

STRUCTURAL CONTRACTS PENDING

25,000 tons, approaches for Philadelphia river bridge, Philadelphia; bids in.

10,500 tons, first unit of Broad street subway, Philadelphia; bids in.

9000 tons, 5000 tons shapes, 4000 tons plates Richmond street substation for Philadelphia Electric Co.; bids being taken.

6000 tons, Penn Athletic club, Philadelphia; bids being tabulated.

5000, tons, Union League club building, Chicago; American Bridge Co. low bidder.

3000 tons, apartment at Nineteenth and Rittenhouse streets, Philadelphia; action expected this week.

2000 tons, Jonathan club, Los Angeles; bids in.

1500 tons, apartment for Bricken Construction Co., Ninetieth street and Park avenue, New York; pending.

1200 tons, repair shops for the Southern railroad, bids asked through Dwight P. Robinson Co., 71 Broadway, New York.

1000 tons, Metropolitan theatre building, St. Louis; bids in.

900 tons, Turkish baths, New York; Longacre Engineering & Construction Co., 345 Madison avenue, New York; general contractor.

900 tons, apartment at Eighty-second street near Amsterdam avenue, New York; J. M. Felson, 1133 Broadway, New York, architect.

700 tons, extension to Haddon Hall, Atlantic City, N. J.; inquiry revived.

600 tons, apartment at Fifty-fourth street, New York; pending.

585 tons, transmission towers Lake Cushman project, Tacoma, Wash.; bids in.

500 tons, Women's hotel, Thirtieth street, New York; Joseph G. Siegel, Inc., 343 Madison avenue, New York, architect.

500 tons, addition to the Museum of Natural History, New York; inquiry revived.

500 tons, plant addition to the New Jersey Zinc Co. at Palmerton, Pa.; bids asked.

250 tons, grade crossing purposes, Big Four railroad; bids in July 17.

200 tons, Allen hospital, Oberlin, O.; Van Blarcom Co. awarded general contract.

150 tons, Nooksack bridge, Bellingham, Wash.; general contract to W. A. Byers, Spokane, Wash., steel not yet placed.

150 tons, four track span across Rocky River, at Rocky River, O., for the Nickle Plate railroad; pending.

150 tons, shop for the Boston Elevated Railways, Boston; bids asked.

100 tons, church, Newton, Mass.; bids being taken.

Tonnage unstated, steelwork for four track subway at Market street, Indianapolis, Ind., for the Big Four railway; bids being taken until noon, July 21, by W. J. Hiner, purchasing agent, 511 West Third street, Cincinnati, O.

Tonnage unstated, addition to punch press shop of Morrison Metal Stamping Co., subsidiary of Hayes Wheel Co., Jackson, Mich.: H. K. Ferguson Co., Cleveland, is engineer and architect.

Tonnage unstated, Perry hotel, Superior and Jefferson avenues, Toledo, O.; plans out in about a month.

Tonnage unstated, 12-story hotel at Cleveland avenue and Third street, Canton, O., for the Stark Hotel Co.; plans out in about 60 days.

Tonnage unstated, plant for metal ceiling department of the Reeves Mfg. Co., Dover, O.; contract to be placed shortly.

Tonnage unstated, Standard club, Chicago; bids in. Albert Kahn, Detroit, architect.

Strike At McKeesport

Pittsburgh, July 15.—The entire force at the hot mill department of the McKeesport Tin Plate Co., Port Vue, Pa., walked out last week, following a reduction of 20 per cent in wages put in effect three weeks ago. No change has occurred since in the situation. Other departments can work only as long as the stock of material lasts.

Car Demand Is Lifeless

Inquiries and Awards Are Few—Track Accessory Buying Light—Norfolk & Western Tonnage Only Rail Business Active

RAILROAD TRACK MATERIAL PRICES, PAGE 133

New York, July 15.—Car demand is lifeless, with little in the way of inquiries or orders. Locomotive buying includes one locomotive for the Montana, Wyoming & Southern, one for the California Fruit Exchange and two for the Ferrocarril del Pacifico, Colombia, all going to the Baldwin Locomotive Works.

Reports that Samuel Vauclain of the Baldwin Locomotive Works has placed 1500 cars with the Pressed Steel Car Co., which he recently booked from Mexico, is denied. The Cambria & Indiana railway has placed 200 hoppers with an unnamed builder.

Sell Light Rail Tonnage

Philadelphia, July 15.—Several thousand tons of light rails were sold in this district last week. The usual quotations on new billet stock is 1.85c to 1.90c, Pittsburgh. Rerolled prices are lower.

Coal Fields Furnish Orders

Pittsburgh, July 15.—From different sections of the western Pennsylvania, West Virginia and eastern Kentucky coal fields occasional orders are received for billet-rolled light rails usually in single carloads. These lately have been more numerous and the majority of bookings have been on a 1.90c basis, although some contracts still carry 2.00c, base Pittsburgh price. Some makers will quote only the latter figure since to name the 1.90c price in the spot market would endanger their contract arrangements. Rail steel light rails have sold at 1.65c, to 1.85c but orders usually are small. Track accessories demand is spasmodic. The new extras on spikes are understood to be observed by the majority of producers. Track bolt orders are scarce. Quoted bases are unchanged.

Fair, Quiet Buying Continues

Chicago, July 15.—Railroad buying of track fastenings is light for the individual roads but the aggregate enables makers to maintain a fair rate of operations. Western makers are not counting upon any part of the 50,000 tons of rails which the Norfolk & Western railroad is expected to place shortly. The heaviest inquiry to come into the rail or fastening market is that of the Great Northern for 3000 tons of tie plates and 106,000 track bolts. Freight car inquiry is nil.

A heartening development is the resumption of shop work by several western carriers who have had their shops completely down for two weeks.

Award Construction Contract

Houston, Tex., July 14.—J. D. Davis Construction Co., Atlanta, Ga., has been awarded the construction contract for building 82 miles of railroad for the Houston, Beaumont & Orange Inteburban Railway Co. The road recently sold a $5,000,000 bond issue to finance the proposed line.

CAR ORDERS PLACED

American Rolling Mill Co., Middletown, O., six gondola car bodies, to the Pressed Steel Car Co.

Cambria & Indiana, repairs to 200 hopper cars; to unnamed builder.

Great Northern railroad, 100 steel underframes, to its own shops.

Philadelphia & Western railroad, 10 passenger cars, to J. G. Brill Co.

Western Fruit Express, 500 underframes to the American Car & Foundry Co.

CAR ORDERS PENDING

Carnegie Steel Co., 12 tank cars; bids asked.

Carr Bros., New York, 10 narrow gage box cars and 10 standard gage box cars; bids asked.

Philadelphia & Reading, expected to place 40 to 70 passenger coaches, 10 baggage cars and 20 to 39 combination coaches this week.

$1 Reduction

Now Quoted on Wire and Nails—Terms of Sale Are Changed

WIRE PRICES, PAGE 133

Pittsburgh, July 15.—Makers of wire products in this vicinity have met the recent shading of prices that has been current and the market now is $1 lower all around or on the level of 2.60c, base Pittsburgh, on plain wire and 2.85c, Pittsburgh, on wire nails. Other products have been modified accordingly. Orders are not numerous, possibly being attributable to the fact that salesmen have been off the road for two weeks or more and makers are making no organized effort to develop sales during the unusually quiet summer period. Operations are restricted accordingly and will average this week about 40 or 50 per cent of capacity.

Strong Nail Demand

Boston, July 15.—Demand for wire and wire products in New England has shown marked improvement, the more striking after several weeks of dullness. Most prices for wire products are well maintained but nails have dropped off to about 2.85c Pittsburgh. Nails, however, show the strongest improvement in sales.

Market Down in East

Philadelphia, July 15.—Lower prices on wire products now are general and the market now is quotable $1 per ton lower. Wire nails generally are 2.85c, base Pittsburgh, against 2.90c, Pittsburgh, and plain wire, 2.60c, Pittsburgh.

Sale Terms Are Changed

Chicago, July 15.—The leading producer of wire and wire products has stiffened its terms of sale. On barbed wire and staples its terms are now 60 days with 2 per cent off for cash in 10 days, displacing the basis of 6 months with 5 per cent off for cash. Woven fence sales are now dated from Nov. 1, on a basis of 60 days with 2 per cent off for cash in ten days and 6 per cent allowed on anticipated payments. The corresponding change in quotations makes galvanized barbed wire now 3.60c, Pittsburgh, and polished staples 3.40c. Plain wire has been reduced to 2.60c, Pittsburgh, and wire nails to 2.85c. Demand from jobbers and for manufacturing lines has improved and the trade appears slightly more confident.

The Nonferrous Metals

European Buying Expanding and Causing Prices Here To Rise—Zinc Selling for Export—Brass Mills Down

	Copper—Electro delivered	Copper—Lake delivered	Spot tin Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Spot nickel
July 9	12.25	12.50	43.12½	7.00	5.77½	26.50	8.25	28.00
July 10	12.32½	12.50	43.00	7.00	5.82½	26.50	8.25	28.00
July 11	12.37½	12.50	43.75	7.00	5.85	26.50	8.25	28.00
July 14	12.37½	12.50	44.75	7.00	5.85	26.50	8.25	28.00
July 15	12.37½	12.50	45.00	7.00	5.85	26.50	8.25	28.00

†Outside market quotation.

NEW YORK, July 15.—Expanding foreign buying of metals with higher prices and increased sterling exchange rates have caused a stronger tone in American metal prices. The allied conference scheduled to be held in London this week in discussion of the application of the Dawes plan has been regarded with much confidence in the metal markets. Copper and zinc have been in active demand from speculators both here and abroad, while consumers of copper have been inquiring for substantial tonnages for deliveries into the first quarter of next year.

Electrolytic copper has advanced ⅛ to ¼ cent from its low of last week, 12.25c, which was the lowest price in a decade excepting for a short period in 1921. Germany has again bought actively, one agency booking 2,000,000 pounds for Germany on Monday. France and England also have been heavy buyers. The largest French consumer has bought 10,000,000 pounds the past few weeks. Domestic brass mills have reduced operations to 40 to 50 per cent but wire mills continue operating 65 to 75 per cent. Casting copper has been selling at 12.12½c, refinery; lake, 12.50c, delivered. Bare copper wire has been selling at 14.25c, base, for carlots.

Fully 2000 tons of slab zinc sold for export last week. The price has advanced to 5.85c to 5.90c, East St. Louis, despite the publication of the June 30 statistics showing an increase in smelter stocks of 7320 tons, following an increase of 9586 tons in May. Retorts operating at the end of June were 75,155 against 81,143 a month earlier. Domestic buying has continued light.

Lead prices have been practically unchanged. Sales for July and August shipment have been made regularly at 6.70c, East St. Louis, and 7.00c New York. However, in points just outside New York the 7.00c basis has been shaded somewhat. The European market has been advancing steadily, despite the fact that all supplies of Mexican and Canadian lead have been diverted to Europe, instead of coming to this country earlier as in the year.

Tin prices have advanced 2 cents from the low of last week, due to buying by London operators. Our market has been weak, New York prices until today being about ½ cent below import costs. Supplies here have been heavy and demand lacking. Straits tin quotations have ranged between 43.25c and 45c the past week.

The aluminum market has remained dull, reflecting the slow conditions in the automobile trade. Inquiry has been light in the open market, with occasional resale lots selling at about 26.50c, delivered, for 98 to 99 per cent virgin ingot.

Spot antimony has held at 8.25c, duty paid, with 8.37½c, duty paid, done on material for importation.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 4 oz., min.	19.50
High brass	16.25
Zinc, ga. 9 to 18 (plates ½c less)	9.50
Lead, full sheets (cut ¼c more)	10.75
Aluminum, bright, 9 to 35 gage	37.50 to 92.00
SEAMLESS TUBES	
High brass	20.50
Copper	21.75
RODS	
High brass, round, ⅜ to 2½-inch	14.00
Naval brass rods	16.75
WIRE	
Copper	14.50 to 14.875
High brass	16.75

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	8.25 to 8.75
New York	7.50 to 7.75
Chicago	8.00 to 8.37
HEAVY YELLOW BRASS	
New York	5.75 to 6.00
Chicago	6.25
Cleveland	5.75 to 6.00
ZINC	
New York	3.25 to 3.50
Cleveland	3.00 to 3.25
Chicago, dross	4.25
HEAVY COPPER AND WIRE	
Cleveland	9.75 to 10.00
New York	9.50 to 10.00
Chicago	10.00
RED BRASS TURNINGS	
New York	7.00 to 8.00
Cleveland	7.50 to 7.75
Chicago	7.50 to 7.75
YELLOW BRASS TUBING	
Cleveland	6.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	6.00 to 6.50
New York	6.00 to 6.50
Chicago	6.25 to 6.50
ALUMINUM BORINGS	
Cleveland	10.00

Secondary Metals

Casting copper, refinery	12.25
Remelt aluminum No. 12	20.50 to 21.50

Fluorspar Sales Spasmodic

Pittsburgh, July 15.—One sale of fluorspar of 150 tons for July delivery, guaranteed 85 and 5 per cent material, brought $19, f.o.b. Kentucky mines. A similar tonnage for August will probably be bought about July 25. Since the above order was taken a smaller tonnage was sold at $18.50 f.o.b. Kentucky mines. It is doubted, however, if the lower figure can now be repeated since the tendency is upward. Some producers are maintaining $22 to $23. Some high-grade imported material is offered here at those figures with 97 to 98 per cent calcium fluoride content.

Seeking Sulphate

Fertilizer Producers Indicate Belated Buying Is Imminent

New York, July 15.—Fertilizer manufacturers are commencing to manifest interest in sulphate of ammonia requirements, and it appears that substantial business will likely be awarded before the end of this month. This usually is placed late in May and early in June. Prices continue unchanged at $2.45 to $2.55 works for domestic account and $2.55 to $2.60, port, in double bags for export. The foreign situation shows no life.

Buyers and sellers of light oil distillates are marking time pending definite indication as to the trend of production. They believe the next fortnight or so will manifest clearly whether production is due for a material increase. Over the past week there has been little change with operations around 40 per cent in most cases. With producers well booked on motor fuel and with production heavily curtailed, prices meanwhile are strong on light oil distillates.

Pure benzol may be quoted at 25 cents, works, in tanks and 30 cents in drums; 90 per cent, 23 cents, works, in tanks and 28 cents in drums; xylol, 28 cents works in tanks and 33 cents in drums, toluol 29 cents in tanks and 31 cents in drums; and solvent naphtha, 25 cents in tanks and 30 cents in drums. Current trading is all for prompt shipment.

Seasonal dullness dominates the naphthalene market, with prices around 5½ cents works on flakes and 6½ cents works on balls. Phenol is holding at 29 cents local warehouses for spot delivery and 25 cents, works, for future shipments.

Coke Oven By-Product

	Spot*
Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	$0.25
Toluol	0.26
Solvent naphtha	0.25
Commercial xylol	0.28
Per Pound at Producers' Plants	
Phenol	0.27
Naphthalene flake	0.05½
Naphthalene balls	0.06½
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.45 to $2.55
Contract	
Pure benzol	Nominal
Toluol	Nominal
Solvent naphtha	Nominal
Commercial xylol	Nominal
Per Pound at Producers' Plants	
Phenol	$0.25
Naphthalene flakes	0.05½
Naphthalene balls	0.06½

*Spot distillates are subject to shading.

Coast Selling Steady

Little Feature to Market But Constant Volume of Fair Proportions—Better Lumber Operation Brings Demand

SEATTLE, July 12.—No developments have featured the iron and steel trade on the Pacific Coast during the week. The holiday season has had an effect and the trade anticipates a period of dullness during July and August. In Washington and Oregon the lumber industry is resuming more generally than was expected and warehousemen state that business has been fairly brisk since the first of the present month, due to this cause.

The Seattle city council has authorized an extensive seawall at Alki beach to cost $100,000. The same body is contemplating replacing the damaged Wheeler street viaduct with permanent steel construction but no decision has been reached. Tentative plans are being drawn for a new $1,000,000 office building in the heart of the business district. Official awards were made this week for the Montlake bridge, Seattle, which will be completed by Aug. 1. 1925, as follows: Substructure, to C. L. Creeman, $159,269; superstructure and machinery to Wallace Equipment Co, $160,425; electrical equipment to Westinghouse Electric & Mfg. Co.

Pig Iron and Coke

The foundry business is slow so that demand for pig iron is limited. Consumers have sufficient on hand for the present and apparently are not worried about future supplies. Importers expect an improved demand during next month. Continental pig iron has receded in price, importing houses stating they can deliver good grades at about $27. This iron recently was as high as $29. It is guaranteed 2.75 silicon and some shipments have analyzed as high as 3 per cent. Best grades of Glengarnock are selling here at $32 but the turnover of all grades is light.

Fernie, B. C. coke is still out of this market because of labor difficulties at the mines. Plean coke is being brought in at $17. There is no shortage notwithstanding the lack of Fernie. Importing houses state that Westphalium coke is offering on a basis of $15 delivered here but in the circumstances demand is lacking.

Bars, Plates and Shapes

The bar situation is unchanged from last week. Local producers report a falling off in demand. Present business in small tonnages but the volume of orders is unsteady. No awards of consequence have been announced in northern territory but contracts for about 1250 tons have been awarded in California during the week. Contracts pending in California approximate 900 tons. Prices are stationary. Local exporters state there is little Oriental inquiry for bars, plates or shapes.

Plates in California are as low as 2.40c c.i.f. but the lowest quotations reported in this territory are 2.45c. Contract for 100 tons for pontoon work in connection with the construction of the Montlake bridge Seattle, was awarded to the Hydraulic Supply Mfg. Co.

Fabricators are awaiting award of 550 tons in connection with the Eagles Temple, Seattle. Bids were received July 8 but it is understood that some revisions are to be made and the contract may not be announced for some time. A local firm is expecting award of 150 tons for the Nooksack bridge, Bellingham, Wash. but confirmation is lacking. The largest pending contract is for the Lake Cushman transmission towers involving 585 tons, bids to be opened July 15. Awards of the week total 1000 tons. The best price quoted in this territory is 2.50c which shows a weakness compared with a week ago, when 2.60c was the going price.

Finished Materials

Jobbers report more activity since the first of the month. This is attributed largely to the fact that many idle logging and lumber plants are making replacements and repairs. A fair demand for tubes, plates, bars, rivets, bolts, nuts, pipe, valves and fittings is reported.

Old Materials

The situation is unchanged from last week. Buyers of steel scrap are paying $9 gross for the best grades but as stocks are fairly ample the demand is limited. Foundries report that No. 1 machinery scrap, cupola size, is on a basis of $20, lower grades being proportionately cheaper.

Scrap Feels Upward Urge

(*Concluded from Page* 134)

ments on old contracts and another is buying such odd lots as are offered to it at low prices, some at $14. Dealers assert they have paid up to $15 for steel to ship to outside consumers who have placed orders here. It is thought no real tonnage could be purchased as low as $14 and that heavy buying might send the market to $15 or even $15.50 within a short time. Prices of other materials are largely nominal as third quarter sales are not really under way in volume.

Cleveland Feels Uplift

Cleveland, July 15.—Light output, greater inquiry and consumer buying in nearby territory rather than in the Cleveland district are influencing prices the market being considerably stronger. Actual trading is light, confined largely to dealers who believe substantial purchases by users will follow the usual midsummer lull. Heavy melting steel now is $15.25 to $15.50; machine shop turnings, $13.25 to $13.50; cast borings, $13.75 to $14; hydraulic compressed sheets, $12.25 to $12.50.

Firmness at Detroit

Detroit, July 15.—Iron and steel scrap shows a firmer tendency with most grades up 50 cents a ton. Dealers say there is some inquiry from consuming mills, but sales have been small. Trade among dealers has been fairly liberal. Mills are more discriminating and are not inclined to follow the strong tendency in prices.

Higher Level at Cincinnati

Cincinnati, July 15.—While trading in iron and steel scrap is small, sentiment is improving. Dealers have again marked up prices on a few items to keep in line with quotations in more active markets. Consumers display more interest than for several months, but no large tonnages have been bought. Considerable inquiry is being received. Many are feeling out the market as reserves are being depleted. Yard stocks which recently have been low are increasing under heavy deliveries by railroads. Lists include the Norfolk & Western, 9000 tons and the Chesapeake & Ohio, 5000 tons.

Better Prices at St. Louis

St. Louis, July 14.—Underlying firmness is plainly manifest in iron and steel scrap, and a number of important items have been advanced, revisions ranging from 25 cents to $1 per ton. The strength is based largely on speculative activities of dealers, but melters have been picking up bargains for investment, and demand for specialties has been stimulated by the inquiry of an East side steel interest for a round tonnage, about 4500 tons.

Several industries have been quietly picking up heavy melting steel, which has been marked up 75 cents per ton. Rails for rolling, which had been inactive for a long while, advanced 25 cents. Everything in steel specialties is strong and offerings are less bountiful than heretofore. Cast grades, while holding firm, are not in particularly strong demand, due to reduced operations at job foundries and specialty plants, notably the stove interests.

Railroad offerings are diminishing, though the recent upturn has resulted in placing fair tonnages at private sale by two trunk lines. Lists before the trade included 900 tons by the Missouri, Kansas & Texas; 4000 tons by the Atchison, Topeka & Santa Fe; 300 tons by the Kansas City Southern; 1400 tons by the Southern railway; 7000 tons by the Norfolk & Western and 150 tons by the Wabash. The Missouri Pacific and Frisco have disposed of tonnages at private sale. The Standard Oil Co. is offering a small tonnage from its Woodriver plant.

Southern Market Inactive

Birmingham, Ala., July 14.—Iron and steel scrap is inactive, little business being transacted and yards are well supplied. Quotations remain stationary, except in two or three instances. Heavy melting steel at $11 is finding no market while stove plate and No. 1 cast have ceased. Railroad wrought has lost a little steadiness as have borings.

Buyers Give Testimony in Bethlehem Suit

New York, July 15.—Hearings by the federal trade commission in its suit for the dissolution of Bethlehem Steel Corp.'s acquisition of the Lackawanna, Midvale and Cambria Steel companies, have been discontinued here. They will be resumed in Philadelphia, but no date has been set.

David H. Smith, of David H. Smith & Sons, jobbers in Brooklyn, testified here that in November, 1920, he reduced his warehouse prices below the level generally prevailing in the New York territory. Other jobbers urged him to go back to the higher level but he refused. He reduced his price until at one time he was selling warehouse material 10 cents less per 100 pounds than the Carnegie Steel Co. from warehouse. Since then, he said, the Carnegie company has not solicited his business. The Waverly warehouse of the Carnegie Steel Co., Mr. Smith said, substantially sets the price in the New York district, since the prices of other jobbers as a rule are the same as Waverly's.

Mr. Smith was asked about the proposed consolidation of iron and steel jobbers. He said he attended one meeting in New York, and it included representatives of about 25 jobbers between Boston and Baltimore. He said each jobber was asked to report his net earnings and the amount of his business, and a committee was appointed to report. Mr. Smith said he did not attend any other meeting as he was not interested. He said efforts had been made previously to bring about such a merger.

Other witnesses who testified about purchases were H. J. McQuade, purchasing agent Lehigh Valley Railroad Co.; F. L. Blendinger, vice president Lehigh Valley Railroad Co.; C. B. Williams, purchasing agent Central Railroad of New Jersey; N. M. Rice, purchasing agent New York, New Haven & Hartford railroad; J. F. Sloan, assistant purchasing agent Interborough Rapid Transit Co., New York, and C. C. Hubbell, purchasing agent, and R. E. King, assistant to purchasing agent, Delaware, Lackawanna & Western Railroad Co.

Baldwin Buys Plant

Philadelphia, July 15.—Baldwin Locomotive Works has purchased the old plant of the Tindel-Morris Co., Eddystone, Pa. This step was taken as a part of the program to expand the Baldwin plants at Eddystone. The Tindel works consisted of a 40-ton basic open-hearth furnace, six steam hammers and two hydraulic forging presses. It had an annual capacity of 24,000 tons of steel ingots and 13,400 tons of forgings. It produced manganese, chrome, nickel and vanadium alloy steel ingots, seamless gas cylinders, rough machined and finished machine forgings, inserted tooth saws, and milling cutters.

Industrial Roads Made Common Carriers

Washington, July 15.—Four industrial roads previously adjudged by the interstate commerce commission to be a part of the plant facilities of the steel companies which they serve have been declared by the commission to be common carriers subject to the Interstate Commerce act and entitled to receive from their trunk line connections divisions of joint rates or absorptions of switching charges. The industrial roads are the Monongahela Connecting Railroad Co., the South Buffalo Railway Co., Union Railroad Co. and the Newburgh & South Shore Railway Co.

Prior to April 1, 1914 the trunk lines published tariffs providing for absorption of switching charges of industrial roads but when on Jan. 20, 1914, in the industrial railways case, the commission found that the industrial roads were plant facilities they discontinued on April 1 in that year their absorption of the industrial roads' switching charges on interstate shipments, but resumed absorption on April 15, 1915, following a decision by the Supreme Court in the tap line cases, in which was laid down general rules for determining the status of a railroad claiming to be a common carrier.

The effect of the commission's decision of July 11 is to establish the status of the four industrial roads as common carriers during the period of nonabsorption of switching charges thus entitling the several steel companies to reparation on shipments during the period from April 1, 1914 to April 14, 1915 on which they paid the charges of the industrial roads in addition to the district rates of their trunk line connections. The complainant steel companies are Jones & Laughlin Steel Co., American Steel & Wire Co., Carnegie Steel Co., Lackawanna Steel Co., and others. Three of the complainant companies control the industrial roads serving them. Some of the complainants also are served by one or more industrial roads controlled by other complainants. The Union Railroad, which serves several of the complainants, subsidiaries of the United States Steel Corp., is controlled directly by that corporation.

Plans for Steel Treaters' Meeting Progress

Extensive preparations are being completed for the sixth annual convention and international steel exposition of the American Society for Steel Treating, to be held on Commonwealth pier, Boston, Sept. 22 to 26, inclusive. The Copley Plaza hotel has been designated as the headquarters, and the plan of having technical sessions in the morning with the exposition closed will be followed again this year. All morning sessions will be held in the ballroom of the Copley Plaza hotel, while the afternoon sessions and symposia will be held in the fine meeting room on Commonwealth pier where the exposition also is held.

The program has been prepared with great care and a tentative schedule of papers will be announced soon. An honorary advisory committee consisting of James M. Curley, mayor of Boston; Dr. Albert Sauveur, Harvard university; Dr. S. S. Stratton, president Massachusetts Institute of Technology; and the president of the chamber of commerce are co-operating with the local executive committee under the chairmanship of A. O. Fulton, vice president Wheelock Lovejoy Co., Inc.

Wickwire Spencer To Be Reorganized

A plan for reorganization of the Wickwire-Spencer Steel Corp. has been prepared for submission to stockholders at a special meeting to be held soon. The chief feature of the plan includes the formation of a new corporation which will take over the present company. The present preferred and common stock will be wiped out and a new common stock issued for which all old stock will be exchanged. Holders of old common stock will received one share of the new common stock for each ten shares of the old and holders of the old preferred stock will receive five shares of the new common stock for each one share of their old stock.

The new corporation will have $12,679, 000 of first mortgage bonds; $2,000,000 of series A five-year 7 per cent notes; $3,650,000 of series B five-year 6 per cent notes, and 1,900,000 shares of no par value common stock.

It is understood that Samuel F. Pryor, chairman of the executive committee of the Remington Arms Co., Inc., will head the new board of directors. Percy A. Rockfeller, who is also a director of the Remington Arms Co., will become a director of the new corporation.

British Trade Is Less Active

Business Awaits Result of Interalli d Conference—Iron and Steel Output, and Exports and Imports Shrink—Belgians Book 12,000 Tons of Rails for South America—Germans Take Large Structural Steel Orders

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, July 15.—Business in the iron and steel trade is awaiting the result of the interallied London conference with respect to European debts. Demand for galvanized sheets, for which some mills have booked orders for delivery as far ahead as October, is less active. Open-hearth furnaces in the Sheffield district are shutting down. Some sales of tin plate to Spain, South America and Australia are noted in the week's transactions. No changes in quotations appear this week.

Production of pig iron in Great Britain in June totaled 607,800 tons, compared with 651,000 tons in May. The monthly average in 1923 was 619,775 tons. Steel production in June amounted to 651,500 tons, against 810,000 in May. Average monthly production last year was 706,166 tons.

British iron and steel exports in June totaled 324,432 tons, compared with 407,000 tons in May, and a monthly average of 355,000 tons in 1923. Imports for June amounted to 175,476 tons. The figure for May was 300,000. The monthly average last year was 111,000 tons.

Brussels reports that the Societe John Cockerill and the Societe Anonyme d'Ougree-Marihaye divided an order for 12,000 tons of rails for South America. Business in France is quiet. Berlin reports that German plates have been sold to South America at £7 10s ($32.85) f.o.b. Chile is making inquiries for plates. The Germans have taken important orders for structural steel for the enlargement of the Suez harbor, and a coaling station in the Orient.

German Credit Stringency Causes Loss

European Special Service

BERLIN, July 3.—Germany's export trade is improving and large orders have been booked recently. Most of this business has been obtained at a considerable sacrifice of prices, brought about by financial necessities of producers. The credit stringency is unrelieved and there is no immediate prospect of easier money. In fact, directors of the Reichsbank recently issued a statement saying they could not grant credits more liberally.

Under pressure of existing financial conditions some German exporters have offered bars in Scandinavia at £6 per ton (1.16c) f.o.b. although the average price is £6 10s per ton (1.26c). Structural shapes also have been sold to Scandinavia. Sheets are also being offered at low prices. Wire nails have been sold for shipment to the Far East at £14 7s 6d (2.80c) f. o. b. A good deal of German finished steel is going to the Far East and South America in competition with American steel.

Domestic business is at a low ebb. Owing to the shortage of money, distress offers are increasing and buyers are holding off. Plants are still shutting down and employes are being discharged. Most mills are in position to give delivery in less than three weeks. Building is inactive and demand for structural steel is limited.

Plants in Upper Silesia are facing special difficulties and works on the Polish side of the border are endeavoring to enforce a 30 per cent cut in wages and the resumption of the 12 hour day. Some Upper Silesian mills are quoting high prices in an effort to bolster up the market. One producer is asking 155 rentenmarks per ton (1.62c) for bars while Westphalian mills are glad to sell for German consumption at 125 rentenmarks per ton (1.30c).

Negotiations have been opened for the sale of the Friedenshuette to the

European Steel Delivered to World Ports

Gross Tons—Prices Last Reported

	U. S. A. North Atlantic Ports	U. S. A. Pacific Ports and Vancouver	Buenos Aires, Rio de Janiero, East Coast of South America	Valparaiso, West Coast of South America	Calcutta, Bombay and Indian Ports	Singapore and Straits Ports	South African, Australian, New Zealand Ports	Hongkong South China	Shanghai and North China	Japanese Ports
*Foundry No. 3 Pig Iron, Si. 2.50-3.00	$27.40	$23.25	$23.65	$25.80	$24.25	$27.50	$28.00	$28.00	$28.55	$28.00
*Hematite Pig Iron, Phos. 0.02-0.05	24.20	25.05	25.45	27.60	26.00	29.25	29.75	29.75	30.30	29.75
Standard rails	39.75	40.85	41.25	43.25	40.50	43.75	44.25	44.25	44.80	44.25
Merchant bars	1.51c	1.58c	1.56c	1.61c	1.49c	1.69c	1.71c	1.71c	1.73c	1.71c
Structural shapes	1.51c	1.58c	1.56c	1.61c	1.49c	1.69c	1.71c	1.71c	1.73c	1.71c
Plates, ship, bridge and tank	1.68c	1.75c	1.73c	1.78c	1.66c	1.86c	1.88c	1.88c	1.90c	1.88c
†Sheets, black, 24 gage	2.64c	2.76c	2.84c	2.79c	2.66c	2.86c	2.88c	2.88c	2.90c	2.88c
†Sheets, galvanized, 24 gage corr	3.61c	3.73c	2.81c	2.76c	2.63c	2.85c	2.85c	2.85c	2.87c	2.85c
Plain wire, base	2.46c	2.53c	2.51c	2.56c	2.44c	2.66c	2.66c	2.66c	2.68c	2.66c
Galvanized wire, base	2.84c	2.91c	2.89c	2.94c	2.82c	3.02c	3.04c	3.04c	3.06c	3.04c
Wire nails, base	3.10c	3.17c	3.15c	3.20c	3.08c	3.28c	3.30c	3.30c	3.32c	3.30c
†Tin plate, base box	$5.21	$5.25	$5.40	$5.35	$5.22	$5.36	$5.39	$5.39	$5.42	$5.39

The foregoing prices are for delivery by cargo liners in ordinary quantities 100 to 1000 tons, c.i.f. to port of destination, but *without* customs duties, unloading charges, dock dues, commissions, etc., at destination. Owing to lack of uniformity in ocean freight rates, cargo shipments by tramp steamers may show considerable variation from these quotations. Pig iron and rails quoted dollars per ton, finished steel in cents per pound, tin plate in dollars per box. Quotations are for *Continental* iron and basic-bessemer steel, except as indicated; for British material add $4.50 to $6.00 per ton.

†British material, basic open-hearth. *British, Middlesbrough.

Current Iron and Steel Prices of Europe

Prices Converted into Dollars at Rates of Exchange, July 14

	British Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgian and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Ports	
Export Prices f. o. b. Ship at Port of Despatch—By Cable	£ s d		Francs		Francs		£ s d	
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$19.27	4 8 0*	$18.81	360	$18.32	400	$23.00	5 5 0
Basic	18.62	4 5 0	19.86	380	17.63	385	26.88	6 0 0
Basic-bessemer	21.35	4 17 6†	18.81	360	17.40	380	23.00	5 5 0
Hematite, Phosphorus 0.02-0.05	21.13	4 16 6	22.99	440	.....	....	25.19	5 15 0
SEMIFINISHED STEEL								
Billets	$30.66	7 0 0	$25.60	490	$25.65	560	$26.83	6 2 6
Wire rods	48.18	11 0 0	36.58	700	33.21	725	30.66	7 0 0
FINISHED STEEL								
Standard rails	$35.04	8 0 0	$31.35	600	$34.35	750	$30.66	7 0 0
Merchant bars	1.71c	8 15 0	1.33c	560	1.26c	605	1.29c	6 10 0
Structural shapes	1.56c	8 0 0	1.33c	560	1.24c	595	1.34c	6 15 0
Plates, ship, bridge and tank	1.76c	9 0 0	1.73c	730	1.54c	740	1.44c	7 5 0
Sheets, black, 24 gage	2.54c	13 0 0	2.73c	1,150	2.70c	1,300	2.63c	13 5 0
Sheets, galvanized, 24 gage, corrugated	3.57c	18 5 0	4.15c	1,750	4.99c	2,400	3.57c	18 0 0
Bands and strips	2.15c	11 0 0	1.96c	825	1.92c	925	1.99c	10 0 0
Plain wire, base	2.35c	12 0 0	2.25c	950	2.29c	1,100	1.99c	10 0 0
Galvanized wire, base	3.03c	15 10 0	3.08c	1,300	2.81c	1,350	3.38c	17 0 0
Wire nails, base	2.83c	14 10 0	2.37c	1,100	2.39c	1,150	2.78c	14 0 0
Tin plate, base box 108 pounds	$4.95	1 2 7½	.....	....	.....	....	$6.35	1 9 0
Domestic Prices at Works or Furnace—Last Reported								**Renten Marks**
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$19.27	4 8 0	$19.59	375(2)	$18.55	405	$22.77	99
Basic pig iron	18.62	4 5 0	19.59	375(1)	17.63	385	25.30	110
Furnace coke	4.60	1 1 0	7.84	150	8.70	190	7.36	32
Billets	30.66	7 0 0	25.08	480	25.42	555	25.30	110
Standard rails	1.71c	8 15 0	1.36c	575	1.56c	750	1.36c	130
Merchant bars	1.76c	9 0 0	1.40c	590	1.26c	605	1.30c	125
Shapes	1.76c	9 0 0	1.36c	575	1.25c	600	1.25c	120
Plates, ship, bridge and tank	1.86c	9 10 0	1.73c	730	1.59c	765	1.44c	138
Sheets, black, 24 gage	2.64c	13 10 0	2.73c	1,150	2.60c	1,250	2.29c	220
Sheets, galvanized 24 gage, corrugated	1.61c	8 5 0	4.15c	1,750	5.04c	2,425	4.90c	470
Plain wire	2.35c	12 0 0	2.25c	950	2.29c	1,100	1.77c	170
Bands and Strips	2.35c	12 0 0	1.96c	825	1.92c	925	1.72c	165

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £1 1s 0d ($4.60) f. o. b. Ferromanganese, £16 10s 0d ($72.27) f. o. b. The equivalent prices in American currency are in dollars per ton for pig iron, coke, semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

Zieleniewski interests in Cracow. Labor trouble in Lower Silesia has resulted in a lockout of 10,000 molders employed in this district.

British Pig Iron Output Increased in May

London, July 3.—Production of pig iron in Great Britain in May according to official figures of the National Federation of Iron and Steel manufacturers, was 650,900 tons compared with 618,400 tons in April, 668,600 tons in March, 636,600 tons at the beginning of 1924, and 714,200 tons in May, 1923. This output represents an increase of 32,500 tons over April and 14,300 tons over January. The May output is the highest this year except for March, when 668,600 tons were produced. Furnaces in blast at the end of May were 191, compared with 194 at the end of April, the same number at the end of March, and 204 at the beginning of the year. Pig iron production in May included 194,900 tons of hematite, 239,300 tons of basic, 148,800 tons of foundry, and 37,400 tons of forge grades.

Production of steel ingots and castings in May was 809,700 tons compared with 711,500 tons in April, 816,900 tons in March, 694,300 tons in January, and 821,000 tons in May, 1923. This represents an increase of 98,200 tons compared with the output for April and is 115,400 tons more than for January.

Details of output from January, 1922 to May, 1924, are shown in the following table:

PIG IRON

	1924	1923	1922
January	636,600	567,900	288,000
February	612,700	543,400	300,100
March	668,600	633,600	389,800
April	618,400	652,200	394,300
May	650,900	714,200	407,900
June	.....	692,900	369,200
July	.....	655,100	399,100
August	.....	599,800	411,700
September	.....	558,600	430,300
October	.....	595,700	481,500
November	.....	598,200	493,900
December	.....	626,900	533,700
Total	.....	7,438,500	4,899,500

STEEL INGOTS AND CASTINGS

	1924	1923	1922
January	694,300	634,100	327,500
February	767,600	767,100	418,800
March	816,900	802,500	549,400
April	711,500	749,400	404,200
May	809,700	821,000	462,300
June	.....	767,700	400,200
July	.....	639,500	473,100
August	.....	567,500	528,400
September	.....	695,100	555,900
October	.....	702,200	565,200
November	.....	749,500	600,800
December	.....	653,300	546,100
Total	.....	8,488,900	5,831,900

A.S.M.E. Meetin December

The forty-fifth annual meeting of the American Society of Mechanical Engineers will be held in New York, Dec. 1-4, according to an announcement just issued. The usual exposition of power and mechanical engineering will be held during the same week in Grand Central palace. The professional divisions of the society have submitted tentative programs for the technical sessions, indicating the meeting will be featured by papers dealing with machine shop practice and power problems.

Deny Merger Report

New York, July 15.—It is officially denied that there is any foundation for the rumor that Republic Iron & Steel Co. and Gulf States Steel Corp. are to be merged. It is stated that no such merger is contemplated.

Crescent Tool & Mfg. Co., Detroit, has increased its capital stock from $50,000 and 5000 shares no par value stock to 50.000 shares no par value stock and $50,000.

Coal Is Principal Power Fuel

Conference of World Engineers Discusses Problems of Resources and Utilization with Relation to Efficiency—Development of Electric Power Factor in Solving Economic Problems Following Recent War

LONDON, July 4.—Opening sessions of the world power conference at the British Empire exhibition, July 1 to 5, were devoted mainly to discussion of power resources of the world and economic and financial problems involved in power development.

Sir John Snell, chairman of the electricity commissioners of the British government, London and Dr. George Otis Smith, director of the United States geological survey, Washington, acted as chairman.

Power resources in coal, oil, waterpower, etc., of the British Empire, United States, and other countries, were discussed. Some 55 papers were presented bearing on these subjects.

Sir Richard Redmayne, in an account of the coal resources of the world, pointed out that in the United States the cost of producing bituminous coal is only about one-third the cost of raising the same class of coal in Great Britain. A large part, probably half, of the coal consumed in the production of power could be saved, he said, by more efficient methods.

The chief power resources of Australia were shown in an official report to be in her coal deposits which, in many cases, are in close proximity to the great centers of population and to this fact must be attributed the hitherto undeveloped state of other sources of power in the Commonwealth. Estimated coal reserves of Australia are 23,000,000,000 tons. Canada must, it was stated in another contribution, be regarded as the world's storehouse for future supplies of coal.

Whatever assistance may be rendered by the utilization of other agencies it was insisted by George Otis Smith that coal would still remain the principal fuel of the world. Oil could not prove an efficient substitute.

M. S. Murray, director of the power survey of the Atlantic coast, New York, pointed out that inasmuch as the actual percentage of power costs to total costs in industry are only 4 to 5 per cent, the actual cost of power plants is a secondary consideration to that of assuring supplies. Adequate power and efficient transportation, he said, are factors essential to success in world trade. Water power resources of various countries were also fully dealt with at the opening meetings.

Sir Robert Horne presided at the opening session on the economic aspect of power resources, Wednesday and Thursday, July 2 and 3. Herbert Hoover, secretary of commerce, presented a paper at these sessions, as well as Owen D. Young, a member of the Dawes commission, Arthur T. Hadley, Julius H. Barnes, and other prominent Americans.

Sir Robert Horne, now chairman of Baldwins, Ltd., steelmakers, Port Talbot, South Wales, and formerly chancellor of the exchequer of the British government, said it would not be regarded as an extravagant estimate of the present condition of affairs to assert that there is not now enough wealth in the world to maintain the old standard of living in European countries. If the standard of living is to be lowered, it can be brought about only with great difficulty and in association with distress, misfortune, and conditions of unrest. There is only one way out of the situation which was created by the war, to increase wealth by adding to the production of the world. It is the fashion to make comparisons between the state of the world today and that which existed after the Napoleonic wars. A recovery from the effects of the wars of the Napoleonic era was brought about through the development of coal fields, the use of steam and machinery, by which it was found possible to create fresh wealth, and not merely to restore losses of the old war period, but to set on foot a great progressive movement. The only practical solution of the problem in sight is a great development of electrical power.

Gen. Guy E. Tripp, chairman Westinghouse Electric & Mfg. Co., Pittsburgh, expressed the opinion that low cost of power in the future depends upon factors which long experience has shown are best managed by private interest. Power supply covers a field in which government enterprise always has been inefficient, notwithstanding the ability of governments to obtain money at lower costs than private interests.

Sir Philip Nash, discussing the economics of world power, said there are sufficient coal reserves in the world to last for countless centuries. Great Britain, he said, has no reason to boast of the equipment for production in her principal industries. It could be shown that only 3.88 per cent of the potential power available from coal, oil and water power is being used in England, while in the United States, Germany, France, Italy and Switzerland the percentages are respectively 8.4, 6.0, 16.7, 32.1 and 36.2 per cent. Great Britain has only entered on her first stage of power development.

C. Kleman said that the system of state management in the power field in Sweden in co-operation with municipalities and individuals has proved an advantage to the consumer and there is now no general controversy concerning the question of state or private management.

Silesian Steel Helpless

Washington, July 15.—The crisis in the iron and steel industry of Upper Silesia, predicted for many weeks, is now a reality, says Acting Commercial Attache Donald L. Breed, Berlin, in a report to the department of commerce. The iron works have now come to the point where in order to undertake export business they must sell at heavy losses. The foreign market grows steadily weaker. Poland is able to absorb only an inconsiderable portion of the total output and the stabilization process now being effected in that country prevents prospect of improvement. Two plants have closed down and a third company is anticipating shutting down. The 17 per cent wage reduction recently agreed upon has not been enough to bring about improvement.

It is generally felt that better business will result only through increased production and radical reductions. Neither seems in sight. The collapse is equally harmful for Germany and Poland and it is felt it will take many months, perhaps a year or two, before the stagnation can be overcome.

Nagle Steel Co. has shut down its plant at Pottstown, Pa., and will continue idle until conditions warrant resumption.

Iron League Refutes Charges

Declares Steel Manufacturers Are Not Refusing To Deliver Material for Fabrication By Organized Labor in New York—No Bonus Paid To Combat Union—Court Action in Protracted Strike

NEW YORK, July 15.—Charges of a conspiracy of large steel companies to wreck the local structural workers' union fell far short in their effectiveness in the hearings which closed here last week before Judge Richard P. Lydon, of the supreme court. The hearings were instigated by the Iron league, of this city, comprised of 14 fabricating and erecting companies, in a $5,000,000 damage and injunction suit against iron workers which have been on strike since May 1. The conspiracy charges were presented by Samuel Untermyer, counsel for the union, in a counter-claim for $10,000,000. A decision probably will be handed down this week.

Mr. Untermyer stated that large steel companies refuse to deliver material into New York except on the erected basis, so that they can be sure no union men are employed by the erecting companies. He declared that the league members are given a bonus of $6 a ton over competitors, because they resist the employment of union labor in their operations. He said an extensive "spy" system is employed.

The plaintiffs denied all the charges and pointed to the fact that 95 per cent of the strikers were union men, as the best answer to the complaint that the steel companies were refusing to have union men erect steel. They showed that a number of the large buildings in this city were erected during the past year or so by contractors employing union labor, with steel supplied by some of the largest fabricators in the country. It was stated that the new Equitable building, the Roosevelt hotel, the Park Lane apartments, and the Steinway building, all large projects, were erected by the Thompson-Starrett Co., which recognizes the union, with material supplied by the American Bridge Co. This also was cited to refute the assertion that the Thompson-Starrett Co. had to dismantle a $200,000 erection plant because it could not buy steel unless it promised not to have the material erected by union men.

Mr. Untermyer charged the members of the Iron league are not sincere in their fight for the open shop because in every other branch of their industry, he said, they had a working agreement with the unions. "The only reason they will not give this union the same agreement as they have with the other unions is that the big steel companies will not permit it," he added.

The league members admitted they had an agreement with the hoisting engineers union. To fully understand the reasons for this, they declared it was necessary to take into consideration the particular conditions prevailing in New York city and in the trade. Before a hoisting engineer can work in the city he must have a state license. For years virtually all licensed engineers operating here have been union members. A man coming into the state must pass an examination, and be recommended by several licensed engineers in this state.

It usually follows that the new engineers immediately become union members, and through force of circumstances, are employed almost exclusively. The agreement provides for the right of erectors to supply men in the event of a shortage, whether the operators desire to become union men or not. The erectors occasionally have done so. Consequently, the league members claim, they were not forced into, or have an agreement fully recognizing the closed shop.

They assert, through their counsel, Merritt Lane, that conditions in the structural workers field do not necessitate such an agreement as they have with the hoisting engineers, and the structural workers' union has violated its agreements in the past.

Mr. Lane traced briefly the history of the structural industry in the metropolitan district since 1906. Prior to that time the erection of steel in New York City was in the hands of the union, but in that year, "because of a violation of the agreement by the union" the open shop was established. This was in effect until 1920, when the Building Trades Employers' association and the Building Trades council agreed upon the closed shop in the industry in New York, whereupon the members of the Iron league resigned from the employers' association. He said the strike May 1 had been to compel the closed shop, which if recognized by the league would mean that nonunion men could no longer obtain work in the metropolitan district.

Denying the league's right to an injunction, Mr. Untermyer referred to provisions of the Clayton act which protected labor organizations, and asserted that all the unions in the country might as well disband if they could be ordered to call off strikes begun for the recognition of the union. The plaintiffs declared that in this case the strike meant the tieing up of a whole branch of the industry in the most active building section of the country in such a way that none but union men could be employed.

Mr. Lane testified that there were cases in New York state in which the courts have ruled that even a single agreement between one employers' association and one union under which only union men could be employed was held to be contrary to public policy. As to the conspiracy charge he stated that even if it were true it was not an answer to the league's request for an injunction on the ground that the strike was illegal.

Mr. Lane testified that the union had used violence to maintain the strike and had resorted to picketing. Later, the court said it could not understand why the union, inasmuch as it was independent of the nonunion men, "bothered with pickets." Mr. Untermyer replied that the pickets attempted to induce nonunion men to join the union, and that it was necessary to have men near the job to report the progress of the strike. He maintained that the unions undoubtedly had the right to picket, as it had been sustained by Chief Justice Taft.

Most fabricators, affected by the strike, report operations now almost up to where they were before the walkout. Some of the strikers have returned, and a number of workers have been recruited from other districts. With few exceptions, it is said, the local wage is higher than anywhere else in the country, while at the same time there is much more construction.

While the league members, 14 in all, are in the minority among the erectors of this city, they erect from 60 to 65 per cent of the work. Last year, it is said, they erected more than 400,000 tons of steel.

Standard Parts Co. Paying Its Creditors

Creditors of the Standard Parts Co., Cleveland, now have received $7,320,522, or 75 per cent of their total claims, according to a report filed by A. V. Cannon, attorney for Frank A. Scott, receiver. Assets on Sept. 1, 1920, when the receivership started, amounted to $29,000,000 against liabilities of $10,331,000, exclusive of capital stock.

Yesterdays In American Industry

Events of News and Technical Importance Reproduced from IRON TRADE REVIEW of Current Issues 10, 20 and 30 Years Ago

1894

July 12 Iron Trade Review

Strikes Envelope Country

LABOR troubles, evidenced by strikes, covered the country, with a resulting paralysis of business. The most serious disturbance, as regards the iron and steel industry, was that of railway workers under the leadership of Eugene V. Debs. This was most prominently localized at Chicago where efforts to move mails and resistance of strikers caused President S. Grover Cleveland to send federal troops to protect railroad property, against the strenuous protests of Governor Altgeld of Illinois, who claimed invasion of state rights. This issue hazards the opinion the worst was over in the strike. Illinois Steel Co. had completely shut down mills and furnaces, due to lack of railroad service.

* * *

A strike of workers in the Connellsville coke regions was in its fifteenth week, an unusual record. Previous strikes, in 1887 and 1891, lasted only thirteen weeks. Unskilled workers were being used but this added to the cost of producing coke and contracts for furnace coke were being made at $1.10, Connellsville, while some favored users obtained $1. Spot furnace coke commanded $1.50 to $2, while foundry spot was available at $2.50 to $3 per ton, Connellsville.

* * *

A quotation from the *Iron and Coal Trades Review*, London, stated that "Mr. Andrew Carnegie has taken a lease for a year of the Earl de la Warr's lovely seat at Withyham, in Sussex, where he has been receiving and entertaining a succession of distinguished visitors." These included Sir John Morley, H. H. Fowler, Shaw Lefevre and others.

"There is no American who is better known in English political circles than Mr. Carnegie. He is persona grata with both Mr. Gladstone and Lord Roseberry. He is hand-in-glove with Mr. Harcourt; and most of the other members of the cabinet have accepted his hospitality, not because he is a millionaire and knows how to entertain as a millionaire should, but because he has an intellect of exceptional acuteness and originality, and has a manner of the most genial and engaging kind."

1904

July 14 Iron Trade Review

Pools Reaffirm Prices

VARIOUS pig iron pools had just met and reaffirmed prices, notes IRON TRADE REVIEW *of July 14. The Pittsburgh correspondent writes that the billet, rail, plate, structural and bar associations, or pools, had agreed on prices. He continues: "As a result of the billet meeting there will be less cutting in the trade than there has been in the past, several interests that led in making low prices having agreed to maintain prices in the future. However, a number of independent manufacturers are still outside the association and quotations from $1.50 to $2 below the reaffirmed process continue to be made." The pool appointed a committee to investigate charges of price cutting by members.*

* * *

Charles M. Schwab was on his way to Europe to investigate armor plate processes with a view to obtaining rights for the Bethlehem Steel Co.

* * *

The hoop and bar plant of the Carnegie Steel Co., Girard, O., built in 1872, was being dismantled and equipment shipped to Pittsburgh.

* * *

The Pennsylvania railroad had laid three lines of 142-pound steel rails in Delaware avenue, Philadelphia. The Pennsylvania Steel Co. rolled the rails, which were 17 pounds per yard heavier than any previous rails.

* * *

A new type of coke car had been produced by the Lackawanna Steel Co., designed for 60 tons of coke. The sides were of expanded metal, saving 2000 pounds in weight.

* * *

For the first time in 10 years Witherbee, Sherman & Co., New York, made shipments of iron ore to Europe. It was high phosphorus magnetite and sold at $1.30 per ton at the mine. During June the company had shipped 12,000 tons to Scotland and Germany and had orders for several thousand tons more.

1914

July 16 Iron Trade Review

Automobile Industry Surveyed

A SURVEY of the automobile situation is interesting in the light of more recent developments. Charles Coolidge Parlin for the Curtis Publishing Co. found among other things that:

The automobile industry is permanent and never will be a monopoly; total sales each year are on the increase; starvation of the weak is at hand; the advertising value of racing is dead; the highest success is the result of concentration on one grade; the future auto may be different in style but will accomplish little more; the most vexatious problem is the disposal of secondhand cars; credit is on the increase.

* * *

Steel rails made by the Tata Iron & Steel Co., India, were being offered in this country to the extent of 20,000 tons, but no sales had been made.

* * *

James A. Farrell was chosen president of the Foreign Trade Council formed at the National Foreign Trade Convention at Washington.

* * *

Freight rates on finished steel products from Pittsburgh were 10 cents per hundred pounds to Cleveland, 16 cents to New York, 18 cents to Chicago and 80 cents to the Pacific coast.

* * *

Agreement for a scale of $5.50 per ton on a 1-cent card, an increase from $5.25, had been signed by the Bar Iron association and the Amalgamated Association of Iron, Steel and Tin Workers.

Some Prices from the Past

	July 16, 1914	July 14, 1904	July 12, 1894
Basic, Pittsburgh	$13.90	$12.35	....
Bessemer, Pittsburgh	14.90	12.45	$11.90
No. 2 Foundry, Pittsburgh	13.90	12.35	10.50
No. 2 Foundry, Chicago	14.00	13.50	10.50
Lake Superior Charcoal	16.00	14.50	14.50
No. 2 Southern, Birmingham	10.00	9.25	....
Bars, Steel, Pittsburgh	1.10c	1.35c	....
Bars, Steel, Chicago	1.28c	1.40c	1.25c
Heavy melting steel, Pittsburgh	12.00	10.75	....
Heavy melting steel, Chicago	9.50	9.50	6.00

IRON TRADE REVIEW
Registered U. S. Patent Office
The Authority of Industry National and International

Charles J. Stark, - - - - - - - - - - Editor
Earl L. Shaner, - - - - - Engineering Editor
John D. Pease, - - - - - Advertising Director

Published Every Thursday by
THE PENTON PUBLISHING CO., CLEVELAND, O.
Member, Audit Bureau of Circulation, Associated Business Papers, Inc., and National Publishers Association

BRANCH OFFICES
BOSTON - - - - - - - - - - 426 Old South Bldg.
CHICAGO - - - - - - - - - - 1147 People's Gas Bldg.
CINCINNATI - - - - - - - - - - 406 Edwards Bldg.
NEW YORK - - - - - - - 2203-2206 No. 220 Broadway
PITTSBURGH - - - - - - - - 2148-49 Oliver Bldg.
SAN FRANCISCO - - - - - - - 675 Monadnock Bldg.
WASHINGTON - - - - - - - - 84 Home Life Bldg.

FOREIGN OFFICES
BIRMINGHAM, ENG. - - - - - - - Prince's Chambers
LONDON, ENG. - 2-3 Caxton House, Westminster, S. W. I.
PARIS, FRANCE - - - - - 23 Rue de la Bienfaisance
Cable Address IROTRAPEN, London, IROTRAPRI, Paris

Subscription, United States, Cuba and Mexico, $6 per year. Canada, $8.50 per year. Great Britain and other countries, £2:0:0 per year

Entered at the Postoffice at Cleveland as Second Class Matter
Copyright 1924 by The Penton Publishing Co.

Unfilled Orders in Historic Decline

HISTORY has been made in the downward movement of unfilled orders of the United States Steel Corp. this year. On June 30 the bookings stood at 3,262,602 tons, the lowest level, without exception, in 13 years or since May, 1911. During that period a vast increase in productive capacity of the steel industry has occurred and relative to capacity, unfilled orders now probably are at the very lowest point that has ever been registered throughout the entire history of the corporation.

Actually there have been only 10 occasions when orders were smaller than the June total in the 22 years since the Steel corporation was organized. One of these was in 1903; two of them in 1908; four in 1910 and three in 1911. From 1902 to March, 1910, the reports of bookings appeared only quarterly instead of monthly as at the present time.

The smallest volume of orders ever reported by the corporation was in December, 1910. At that time bookings declined to 2,674,757 tons. In June, 1924, the total was only 588,000 tons above the extreme low point of 14 years ago. Compared with the peak of 1924, orders have declined 33 per cent. They have declined 56 per cent from the 1923 peak and are 76 per cent smaller than they were at the highest point in 1920. From that great altitude orders suffered a tremendous slump reaching their lowest point for the ensuing depression in February, 1922. Compared with the extreme bottom of that reaction orders are now 21 per cent lower.

The extraordinary decline in orders does not reflect a corresponding recession of consumption. Production, though deeply depressed, is double that reached at the low point of 1921. The explanation of diminished bookings is to be found in the close hand-to-mouth buying by steel consumers. This has been made possible and encouraged by the three factors of ample production and supply of steel, exceptional railroad efficiency in shipments of material, and a general downward price tendency.

These conditions have removed the incentive to place large forward commitments. At the same time the situation is one which keeps the steel producer in close touch with current demand, enabling him to regulate his output closely in accordance with consumptive requirements. The day of the huge backlog of unfilled steel orders has gone. At present its return is not in immediate prospect.

Labor Banks Refute Politicians

IN THE last four years the number of labor banks in the United States has increased from one to 33, and their combined resources have advanced from $200,000 to $100,000,000. The vice president of the Federation Bank of New York made this announcement a few days ago, evidently with pride in the achievement of organized labor. Whether he was aware of it or not, his statement strikes a note in strong contrast with others that have been heard recently in the babble of politics. It should appeal more to the rank and file of labor than some of the glib speeches by professional politicians.

Labor banks have so greatly multiplied in the last four years, and their resources have grown 500 per cent, mainly because of sound doctrines in American government, and the wise, rational administration of laws. Yet the leaders and members of the brotherhoods and other trade unions that have found it so easy to dot the map with banks, in a political convention in Cleveland, endorsed a platform and a candiate for President, La Follette, on the ground that "government has betrayed labor."

Organized labor's prosperity, and the welfare of the individuals from whom its banks have derived support, refute this claim. The leaders had positive evidence to the contrary, while they cheered a trick political phrase. Fortunately, and probably just because of this, organized labor does not

vote as a unit; some of the members think for themselves.

The word "betrayed" is appearing with great frequency in interviews with those who are striving to stir up discontent. The Workers party of America put into the field for President an arch-enemy of good government, William Z. Foster, with the announcement that La Follette "betrayed" the workers, and has gone over to "the propertied middle classes." The Farmer-Labor party, rebuked for too bold a display of bolshevism, has turned against La Follette and given such support as it has to Foster. Eugene V. Debs, many times Socialist candidate for President, who led the great railroad strike of 1894, and who served time for anti-government activities during the World war, has pledged himself to La Follette. Politics has made chameleons of many but the reddest of the red. Will the Socialists and the gentle anarchists have strings on the next President of the United States? Not if the voters heed the lesson of those labor banks.

Specifications Are More Definite

IT WOULD be interesting if the figures were available to compare the ratio of so-called "tonnage" steel to "special" steel produced today with that of 10 or 20 years ago. The output of each grade has increased considerably, but the quantity of "special" steel doubtless has increased more than that of the standard material.

This gradual change probably is explained by the tendency in modern manufacturing methods to specify steel requiring the least preparation for final use. For instance, 10 years ago most of the automobile builders bought sheet and strip steel with the idea of having to depend largely on abrasives, enamel, etc., for the final appearance of the finished product. Today a special steel is specified which is as free from imperfections as present knowledge and skill permit, is especially adapted to the forming operations and takes a high finish with a minimum of preparation.

The wider use of alloy steel also has given impetus to the tendency to specify special steels. Years ago if a manufacturer wanted to make a fine crankshaft, he purchased a good grade of steel and nursed it through the forging and heat treating processes according to the light of his own experience. Today dozens of alloy steels of standard analysis, each adapted to a certain definitely prescribed heat treatment, may be purchased.

One beneficial result of the trend toward more exact specifications is the necessary greater cooperation between steel producer and consumer that is implied. The steelmaster must know more than he has known before of the manner in which his customers use his steel. This being the case, he is likely to see that his product is applied in the way best calculated to utilize its special properties. Such interest on the part of the producer will go far in developing constructive salesmanship. Perhaps it will lead the way to selling steel on the basis of what it will do rather than on what it is. Too many consumers still believe "steel is steel," oblivious to the fact each kind has distinguishing characteristics.

Automotive Industry In New Stage

EFFORTS of some of the leading automobile builders to modify their production methods whereby their outputs may be adjusted more closely to actual demand, are significant of some of the changes that are receiving attention in that industry. At the present time an automobile manufacturer at the beginning of a season usually sets out to build a certain number of machines which, more often than not, is arbitrarily fixed in accordance with personal ambitions or manufacturing facilities rather than by the breadth of the market.

Pursuit of this outlined policy in anticipating sales with production and without a clear ascertainment of probable buying demand, has brought many builders to grief, especially this year when the market from various causes has fallen far short of expectations.

The story runs that the automobile interests have been much impressed by the rapid and effective way in which the steel producers have handled their problem of adjusting production in recent months to a sharply shrinking demand. It is felt that if operations in the automboile industry can be made more flexible to permit them to be readily expanded or contracted as the actual demands require, the present danger of overflooding the market with consequent demoralization of the industry, largely will be averted.

These plans directed at giving the automobile industry a more economic administration point to the fundamental forces that are at work in the business.

As there have been other and similar evidence, it is indicated the industry rapidly is passing from the flush period, where an increased market each year could be counted on with reasonable certainty, and is entering the area of more restricted development where more intensive manufacturing and competitive conditions will prevail. These are wholesome signs for they suggest what has become one of the country's greatest mechanical industries is progressing toward greater stabilization and security.

Current Statistics of Industry

Unfilled Bookings Again Show Decline

For the fourth consecutive month, unfilled bookings of the United States Steel Corp. declined, the total as of June 30 being 3,262,505 tons. This is a reduction of 365,584 tons, or 11.1 per cent, and compares with 580,358 tons, the reduction in the preceding month which was the largest from the standpoint of tonnage since June 30, 1923, when the decline amounted to 595,090 tons. Further comparisons follow:

Date	Total	Change, tonnage	Change, per cent
June 30, 1924....	3,262,505	365,584—	11.1 —
May 31, 1924....	3,628,089	580,358—	13.79 —
April 30, 1924....	4,208,447	574,360—	12.008 —
Mar. 31, 1924....	4,782,807	130,094—	2.6 —
Feb. 29, 1924....	4,912,901	114,472+	2.3 +
Jan. 31, 1924....	4,798,429	350,183+	7.8 +
Dec. 31, 1923....	4,445,339	76,755+	1.7 +
Nov. 30, 1923....	4,368,584	304,241—	6.5 —
Oct. 31, 1923....	4,672,825	362,925—	7.2 —
Sept. 30, 1923....	5,035,750	378,913—	6.99 —
Aug. 31, 1923....	5,414,663	496,100—	8.4 —
July 31, 1923....	5,910,763	475,498—	7.4 —
June 30, 1923....	6,386,261	595,090—	8.5 —
May 31, 1923....	6,981,351	307,158—	4.21 —
April 30, 1923....	7,288,509	114,823—	1.5 —
Mar. 31, 1923....	7,403,332	119,343+	1.63 +
Feb. 28, 1923....	7,283,989	373,213+	5.40 +
Jan. 31, 1923....	6,910,776	165,073+	2.31 +

Beehive Coke Production Continues Decline

Washington, July 15.—The observance of July 4 as a holiday was reflected by a sharp decline in the production of beehive coke which fell to 95,000 net tons in the week ended July 5. That this decrease of 35,000 tons was not due entirely to the shutdown on the holiday is shown by the fact that the average daily output for the five working days was 2000 tons less than the average in the week before. The principal decrease occurred in Pennsylvania and Ohio, with less important losses in West Virginia, Washington, and Utah. The weekly record of output by districts follows:

	—Week ended— July 5, 1924a	June 28, 1924b	July 7, 1923
Pennsylvania and Ohio	63,000	85,000	306,000
West Virginia	5,000	6,000	23,000
Alabama, Kentucky, Tennessee and Georgia	13,000	18,000	19,000
Virginia	6,000	6,000	15,000
Colorado and New Mexico	5,000	5,000	8,000
Washington and Utah	3,000	5,000	5,000
United States total	95,000	125,000	376,000
Daily average	19,000	21,000	75,000

(a) Subject to revision. (b) Revised from last report.

The production of bituminous coal in the week ended July 5 was the lowest output for a fourth of July week recorded in the eight years the coal production statistics have been compiled.

Metal Trade Income High

Washington, July 15.—Profits of metal and metal products industries in 1922, were larger than in any other manufacturing industries except textiles and food products is shown by the treasury departments preliminary report on statistics of income for the year.

The total net income of manufacturing industries in 1922 was $220,384,722, or 7.76 per cent of the total net income derived in that year from business pursuits, according to the report. The net income of metal and metal products industries was $29,046,828, or 1.02 per cent of the total.

The income of food products, beverage and tobacco industries was the largest, totaling $60,247,515, or 1.77 per cent of the total net income derived from business pursuits. The net income of the textile and textile products industries was second totaling $38,114,368, or 1.35 per cent.

Index to Business Trend Charts

THIS ISSUE

Subject	Page
Monthly Ingot Production	154
Steel Orders and Prices	154
Car Orders	155
Railroad Earnings	155
Bradstreet's Index	156
Commercial Failures	156

REFERENCES

Building Cost Index	July 10
Corn and Wheat Prices	July 10
Foundry Pig Iron	July 10
Iron and Steel Foreign Trade	July 10
Iron and Steel Price Parity	July 10
Pig Iron Situation	July 10
Employment Index	July 3
Independent Sheet Situation	July 3
Index of Basic Production	July 3
Foreign Trade	July 3
Steel Castings Bookings	July 3
Wholesale and Retail Prices	July 3
Bonds and Interest	June 26
Business Index	June 26
Farmer Purchasing Power	June 26
Merchant Pig Iron	June 26
Security Prices	June 26
Structural Awards	June 26
Bank Clearings	June 19
Building Construction	June 19
Automotive production	June 19
Electric Power Production	June 12
Freight Car Movement	June 12
Steel Price Index	June 5
Foreign Exchange	May 29
Wage Situation	May 15
European Conditions	May 8
Mail Order Sales	May 8
Monthly Coke Output	April 24
Monthly Commodity Prices	March 13
Monthly Alien Migration	Feb. 14
Freight Factor	Nov. 1
Coal Production	Nov. 8
Steel Earnings	Nov. 8

Sheet Mill Wages Respond to Lower Prices

The average price of 26, 27 and 28 gage black sheets sold by mills represented in the Western Sheet & Tinplate Manufacturers association during May and June was 3.60 cents per pound, a decline from 2.70 cents in March and April. Wages of sheet and tin plate mill workers in July and August, therefore, will be reduced from 46½ per cent above base to 43½ per cent. This was determined at the bimonthly meeting of representatives of the mills and the Amalgamated Association of Iron, Steel and Tin Workers in Youngstown, July 11. A comparison of price averages, governing wages for the periods designated, follows:

July-August	3.60c	— 3 per cent
May-June	3.70c	— 1½ per cent
March-April	3.75c	unchanged
January-February, 1924	3.75c	unchanged
November-December	3.75c	+ 1½ per cent
September-October	3.70c	+ 3 per cent
July-August	3.60c	+ 6 per cent
May-June	3.40c	+ 3 per cent
March-April	3.30c	unchanged
January-February, 1923	3.30c	+ 3 per cent
November-December	3.20c	+ 4½ per cent
September-October	3.05c	+ 4½ per cent
July-August	2.90c	+ 3 per cent
May-June	2.80c	unchanged
March-April	2.80c	unchanged
January-February, 1922	2.80c	+ 1½ per cent
November-December	2.75c	—10½ per cent
September-October	3.10c	—15 per cent
July-August	3.85c	— 3 per cent
May-June	3.95c	—10½ per cent
March-April	4.30c	—25½ per cent
January-February, 1921	5.15c	—19½ per cent

Car Loadings Less

Washington, July 15.—Car loadings during the week ended June 28 totaled 908,355 as compared to 1,021,471 in the corresponding week of last year. Coal loadings totaled 144,759, compared to 185,324; coke, 6968 compared to 14,745, and ore 59,198 compared to 80,791. Surplus cars numbered 359,644 on June 21 and the shortage totaled only 73, according to the car service division of the American Railway association.

The car surplus June 30 was 356,389, as reported to the car service division of the American Railway association. The shortage on the same date was 98.

Ford Sales Are Larger

Detroit, July 15.—The Ford Motor Co, reports that sales during the first six months of 1924 were 1,036,978 cars and trucks, a gain of 133,000 over the same period in 1923.

The Business Trend

July 17, 1924

BY JOHN W. HILL, FINANCIAL EDITOR

FOUR events—the democratic nomination, the government crop estimates, the report of unfilled steel orders, and the apparent passing of a fresh European crisis—have weighed most heavily in recent financial and business considerations.

Politics actually have had but small bearing upon the fortunes of trade this year. However, the fact that both major parties in the campaign are to be led by men of sound economic views has had a favorable effect upon sentiment.

Radicalism will fulminate through the safety valve of the LaFollete party. But the prospects of that movement have been dimmed by the persistent bouyancy of grain prices. Even livestock is firmer and farmer discontent, LaFollete's chief source of hope, is less acute.

The latest crop forecasts show why grain prices have advanced. Bumper harvests are not in store this year. The corn yield is expected to fall 531,000,000 bushels below that of 1923. Wheat may drop 45,000,000 bushels to the lowest since 1913.

Buying Power Helped

The farmers will have smaller food crops to sell. However, present indications are that they will receive as much or more, cash for them as for last year's big crops. This means even greater purchasing power than in 1923 because the things the farmer buys are lower in price than one year ago.

Significantly, the commodity price structure is steadying. As shown by the Business Trend graph Bradstreet's index on July 1 registered the smallest decline in five months. Strength is most pronounced for agricultural products, but many other goods are dropping less rapidly.

Orders at Low Ebb

A faint measure of cheer is found in the report of unfilled orders of the United States Steel Corp. The decline on June 30 was the smallest drop since March. The total however is at the lowest point since May 1911. This reflects hand to mouth buying and prompt shipments but not a corresponding drop in consumption.

Two great factors in steel activity, automobile output and building, continue to slump. Building in June dropped 17 per cent from the May total, but was slightly ahead of June 1923. Motor car output in June was down 15 per cent from May and 30 per cent from one year ago.

Agreement is foreshadowed between France and England on the application of the Dawes plan. An American arbitrator on the reparations commission to determine German's possible defalcation under the plan may be agreed upon.

That might reassure American and other investors, who would otherwise fear impulsive political and military unheavals growing out of the plan. In order to put in operation 200,000,000 must be borrowed. The European outlook is distinctly better.

The Barometer of Business

Weekly Comparison

	Last week	Week before	One mo. ago	One year ago	1913
Business Failures..	281	363	391	330	...
Cash ratio Fed. Res. System %	82.5	81.5	82.4	75.4	...
Loan rate, 4-6 mos. N. Y. %..	3½	3½	...	5	3½
Aver. 25 industrial shares	$113.09	$111.95	$109.32	$107.57	$59.19
Aver. 25 railroad shares	$67.22	$66.44	$65.60	$58.07	$82.91
Aver. 40 bonds ..	$80.68	$80.53	$80.46	$76.14	$93.00
Car loadings, week ended June 28..	908,355	903,700	819,904	1,021,770	*891,621
Bank debits 246 cities (000 omitted)	$8,249,329	$11,358,516	$9,336,226	$9,767,612	.....

*1920

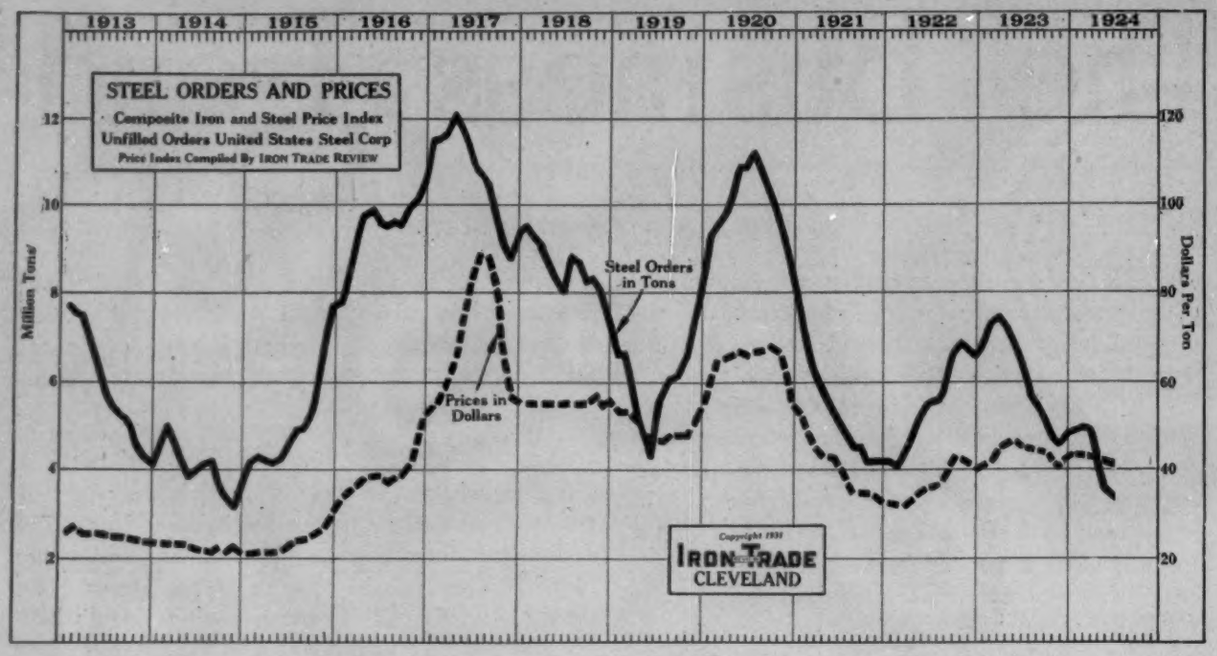
Foreign Exchange (Demand)

	Normal	Last week close	One week before	One month ago	One year ago
Sterling	$4.86	$4.37	$4.32	$4.31	$4.60
Francs	19.3c	5.17c	5.022c	5.38c	5.87c
Lira	19.3c	4.32c	4.26c	4.34c	4.29c

Monthly Comparison

		One Month before	One Year ago	1913 Mo. average
Dodge Bulding awards in 27 states (sq. ft.)	June 48,064,100	57,708,800	47,512,100	31,250,000
Business failures: Number	1,607	1,816	1,358	1,336
Liabilities ..	$34,099,031	$36,590,907	$28,678,276	$22,732,000
Exports	*$336,000,000	$348,000,000	$316,359,000	$233,195,000
Excess of gold imports	*$40,480,000	$44,027,000	$45,331,751	†$630,716
Bureau of labor price index ..	*147	148	156	100
Bradstreet's price index	132.2	133	141.6	100
Economist's British price index	166.7	166.6	158	100
Nat'l Industrial Con. board living cost index	*161.4	161.8	160.3	‡100
New incorporations	$455,022,400	$519,897,000	$1,403,336,000	$49,301,000
Railroad net earnings	*$60,595,000	$61,821,000	$90,252,900	$59,301,000

†Excess of gold exports. ‡ July, 1914. *May.

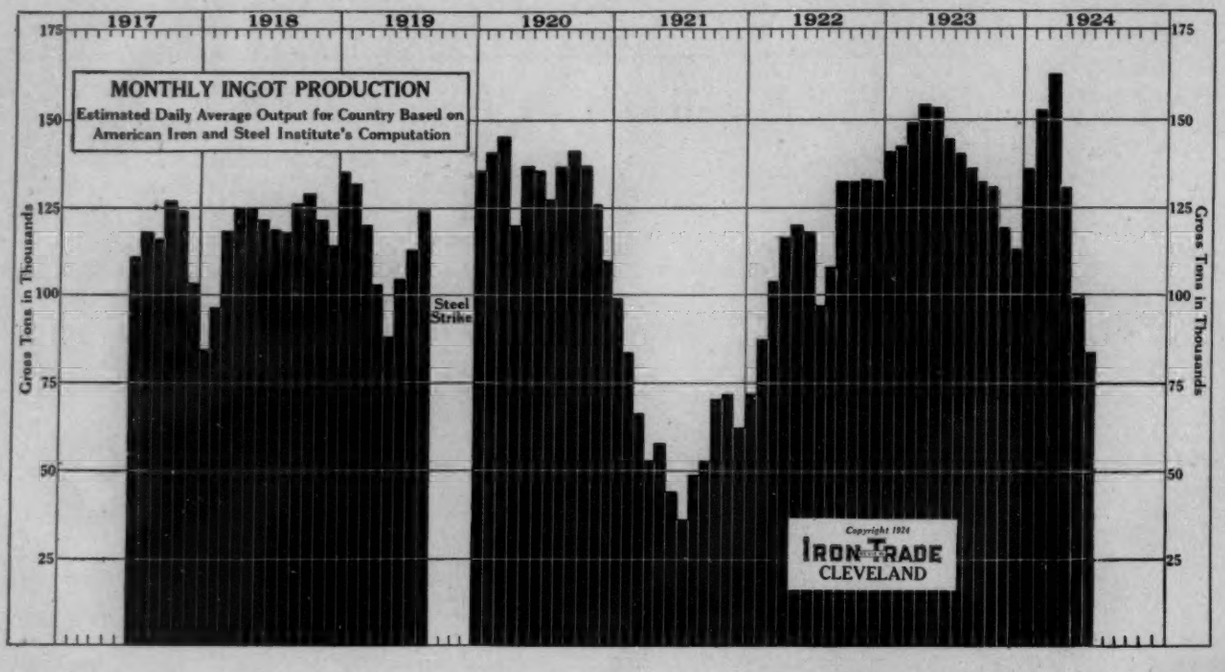


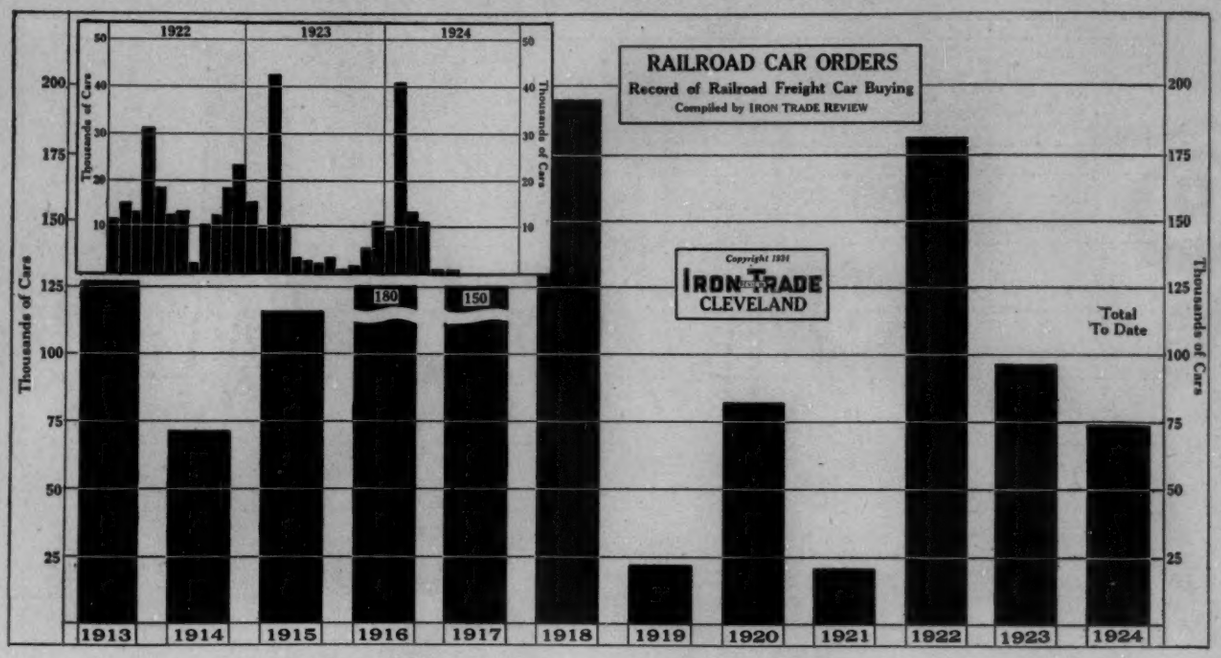
Steel Orders

THE decline in unfilled orders of the United States Steel Corp. in June of 365,384 tons was the smallest loss since March. It compared with decreases of 580,358 tons in May and 574,360 tons in April. The total volume of bookings on June 30 was 3,262,000 tons. That is the lowest level touched in 13 years or since May 1911. Orders are now 21 per cent smaller than they were at the extreme low of the 1921 depression. Prices as measured by the IRON TRADE REVIEW composite market average the 21 per cent higher than the low point of that reaction.

Ingot Production

DURING June the production of steel ingots dropped 15.5 per cent to the average daily rate of output of 82,259 tons. From the record breaking peak touched in March the decline has been 40 per cent. This decline has been exceeded in recent times only in the three months period from February to April in 1921. Last month the annual rate of output dropped back to 25,582,000 tons, the lowest since September 1922. This compared with an indicated rate of 49,590,000 tons attained in March 1922. The March peak was the highest ever attained.



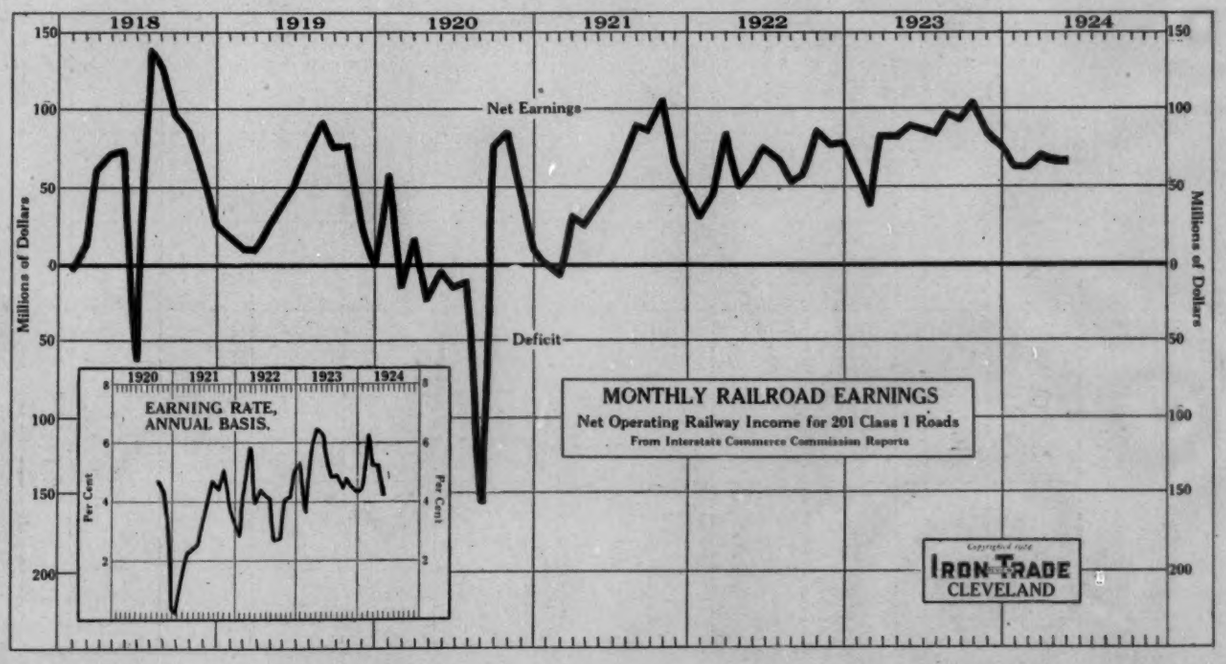


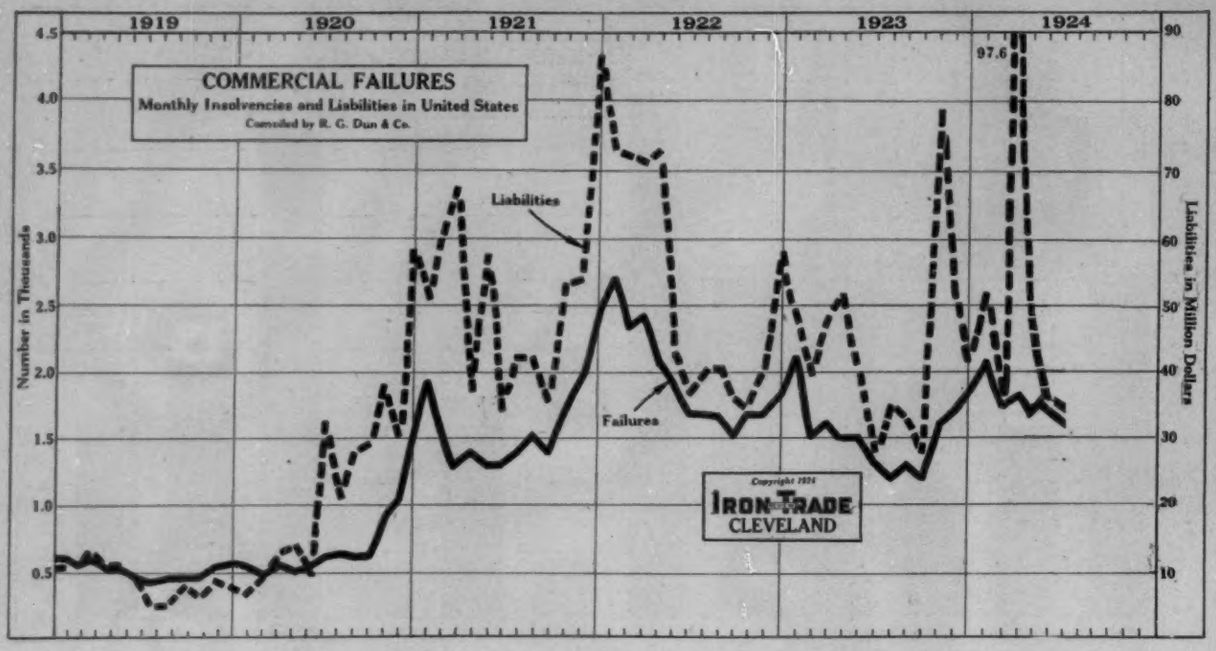
Car Orders

AN irreducible minimum in nearly reached in the matter of railroad car awards. Freight car orders in June were only 438. This compares with 511 in May and with 1785 in June 1923. Last month's total was the smallest since August 1921, the low point of the great depression of that year, when only 150 cars were ordered. During the first half of 1924, 73,904 cars were ordered by the roads. This compares with 88,184 for the corresponding period of 1923. Last 88 per cent of all the orders were placed in the first half.

Railroad Earnings

RAILROAD earnings are shrinking under the influence of receding traffic totals. In May the net income of Class 1 roads amounted to $60,595,197 compared with $90,252,652 in May 1923. This was a decrease of $29,657,000 or 33 per cent in a year. In April net earnings were $61,821,000. May net income was at the annual rate of 4.27 per cent on estimated property valuation. In May 1923 the net amounted to 6.24 per cent. Western roads have suffered most severely from slackening business and their rate of return in May was only 2.09 per cent.



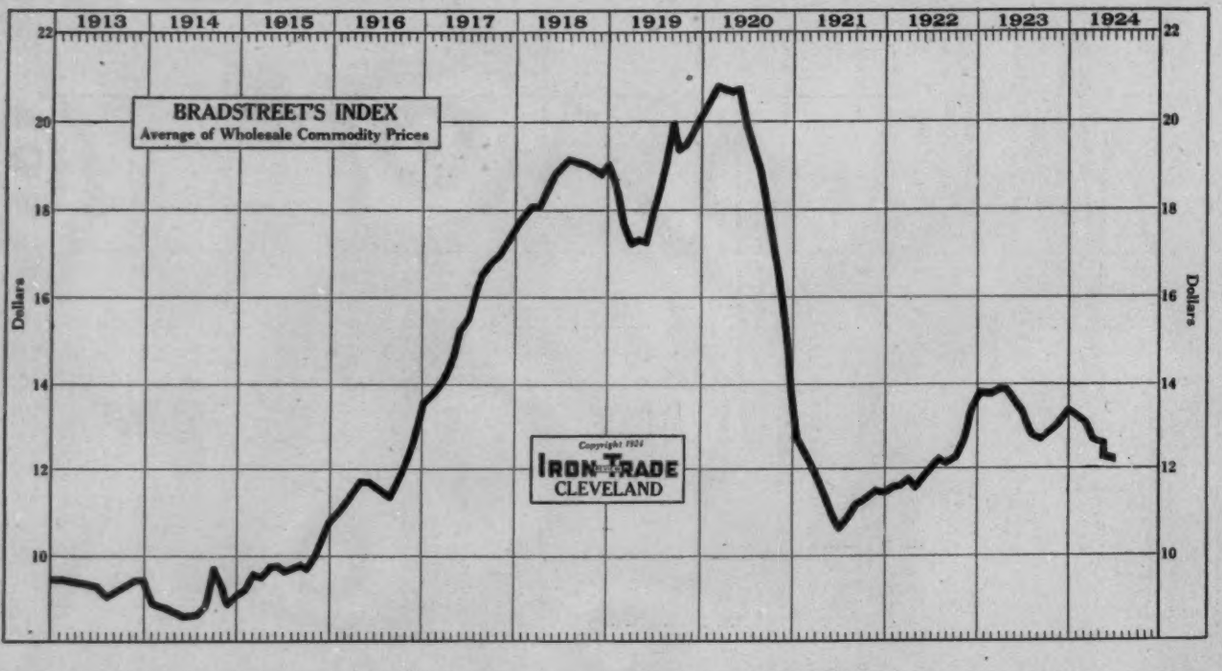


Business Failures

THE present business recession has not disturbed the normal course of commercial insolvencies. They usually decline in June and last month was no exception. The number of failures in June was 1607 with liabilities of $34,099,031. These figures represent decreases of 11.5 per cent in number and of 6.8 per cent in liabilities from May totals. Compared with June 1923, there were increases of about 18 per cent for both items. In the second quarter there were 9 per cent fewer failures and 35 per cent less liabilities than in the first.

Bradstreet's Prices

A NOTABLE and significant development has been the apparent steadying of the price structure. On July, the recession of 0.5 per cent noted for Bradstreet's wholesale price index was the smallest decline in five months. The price level, by this measure is now 32 per cent above the 1913 average. It is 41 per cent below the 1920 top and 6 per cent below the figure of 12 months ago. Strength of grain prices has been the outstanding feature of commodity values of the past month. Many other values are weaker.



Orange County Ironmaking--I

District Was Principal Producer in New York State in the Seventies —Historic Chain Made at Sterling Iron Works

BY E. C. KREUTZBERG

Part of the Chain that Was Made at the Sterling Iron Works in Orange County, New York, and Used to Block British Ships in the Hudson River During the Revolution, Now Reposes at West Point

ORANGE county, New York, once was an important iron center and for a considerable period was the principal producing district in New York state. Its principal achievements were the production of the great iron chain that was placed across the Hudson during the Revolution to stop the British, and the production of iron for the famous Parrott guns of the Civil war.

The iron industry in that county started prior to 1750. The last furnace in blast in the county was the Sterling stack, which was discontinued in 1891. Today the only active iron enterprise in the county is the Fort Montgomery Iron Co. which produces iron ore for the market.

Governor Clinton reported in 1750 that there was a plating forge with a tilt hammer at Wawayanda, about 26 miles from the Hudson river. This was a plant where iron was beaten out into plates, principally for the manufacture of spades and other tools and implements. It had been built four or five years previously by Lawrence Frawley, a blacksmith, but was not then in use.

It is recorded that the famous iron ore deposit on Sterling mountain was discovered in 1750 and that a London firm, Ward & Colton, completed a blast furnace there the following year. However, Charles Clinton, who surveyed this entire region in the years 1735-1749, mentioned the Sterling Iron Works in his notes as early as 1745.

It seems certain that the Sterling furnace of 1751 was the first blast furnace in the county. This furnace soon became the nucleus of an industry. The early records state that Abel Noble, of Bucks county, Pa., in 1753 erected a forge at Monroe, near the Sterling furnace, and the furnace and forge comprised a large industry. Because of the lack of roads, all of the materials used at the furnace were transported on horseback. It is said that the first anchor made in New York state was produced at the Noble forge in 1753.

Later the furnace and forge were consolidated under one ownership and there was considerable expansion. During the Revolution the Sterling Iron Works was an important source of munitions for the Continental forces. At the outbreak of the war the plant consisted of the blast furnace, a forge and anchor and a steelworks and forge. In 1777 a second Sterling furnace was built. In a petition to the New York convention, dated April 12, 1777, the Sterling Iron Works listed its necessary employes as follows:

"A List of Men to Enable the Carrying on the Sterling Furnace, Forge, Ancory and Steel Works is as follows, viz:

FOR THE FURNACE

20 men, Wood cutters.
4 Master Colers, Each 4 men—is
3 Men for Raising Oar, 2 Men for Carting ditt.
7 Men Carters for Hauling Coles,
2 Men for Stocking Coles, 1 Banks man,
2 Men Burning Oar, 2 Mine Pounders,
2 Fillers of furnace, 2 Founders,
1 Gutter man, 1 Black smith, 1 Carpenter,
1 Manager, 1 Clark, 68 men.

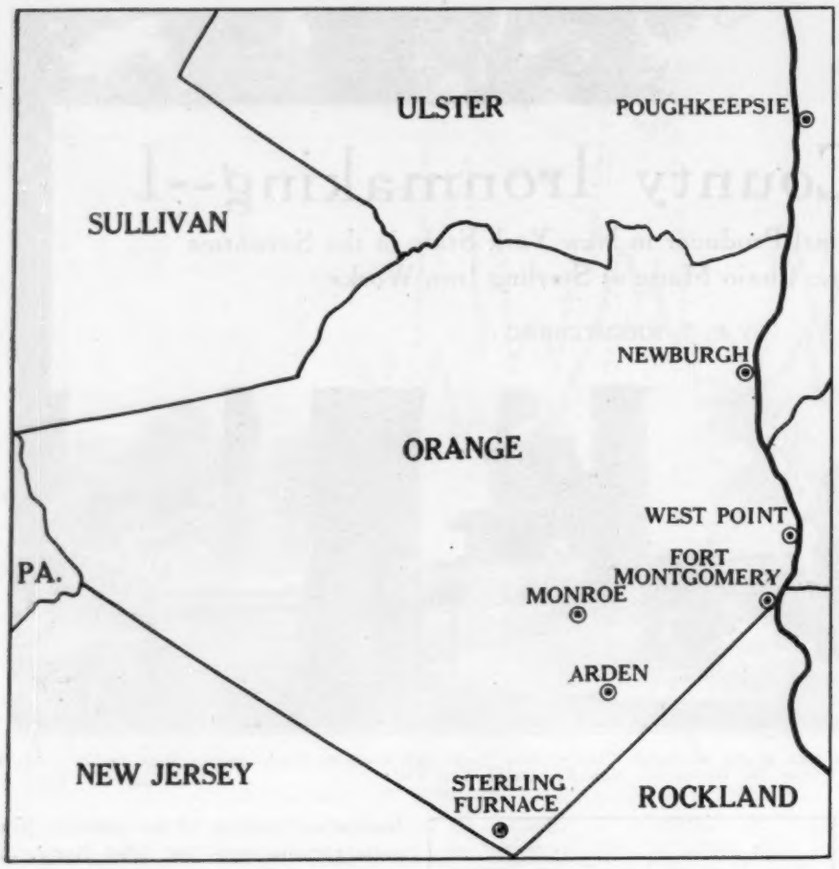
FOR FORGE AND ANCORY

20 men for Cutting Wood,
3 Master Colers, Each 4 Men,
5 Men Carters for Hauling Coles,
2 Stocker of Coles,
10 Men for Makeing Iron in five fires,

The author is associate editor at New York of IRON TRADE REVIEW.

War and Ironmaking

ONE of the interesting chapters in the history of American ironmaking is that which describes the manufacturing enterprise during the Revolutionary war. A center for the production of iron for use by the Continental forces was in Orange county, New York, and the industry there was of considerable scope. For the facts set forth in this sketch of ironmaking in Orange county, IRON TRADE REVIEW *is indebted largely to the work of Richard D. A. Parrott and of the late Macgrane Coxe. Mr. Parrott, who lives at Flushing, L. I., and Mr. Coxe, a member of the Townsend family of ironmakers, who recently died at Southfield, N. Y., were able, by consulting their family records, to clear up many obscure points, and to correct a number of errors which have been made by historians. It is believed therefore, that the accompanying article represents as accurate a history of the iron industry of Orange county as it is now possible to set forth.*



MAP OF ORANGE COUNTY, NEW YORK, SHOWING THE LOCATION OF TOWNS AND CITIES MENTIONED IN THE HISTORICAL SKETCH OF IRONMAKING

10 Men for Makeing Anchors, three fires,
1 Carpenter, 1 Black smith,
1 Manager, 1 Clark, 65 men.

FOR STEEL WORKS AND FORGE

15 Men for Cutting Wood,
3 Master Colers, Each 4 men,
4 Men Carters for Bringing the Coles,
1 Stocker of Coles, 1 Man to Cart Pigs,
6 Men for Makeing Steel, in three fires,
4 Men for makeing iron in two fires.
1 Carpenter, 1 Black smith,
1 Man to manage the Bussiness, 49 men.

49 men

Accompanying the petition for exemption of the employes was a letter from the deputy quartermaster general, Hugh Hughes, who said:

"The reputation of their iron is such that General Knox desired that I would purchase no other for the use of the laboratory and train, nor will any other that has been tried in our department bear plating for spades, etc., as theirs does. Nor is their steel less necessary, having contracted for several tons, which ought to have been delivered before now, but has been delayed on account of their hands being drawn out on sundry occasions."

This request for exemption was granted by the New York convention on April 23, 1777.

The Sterling Iron Works furnished much notable material, including the anchors for the first ships of war that carried the stars and stripes, and particularly for the United States frigate CONSTITUTION. It cast the first of a large number of cannon for the frigates of that time. But its outstanding achievement was the production of the great chain which was stretched across the Hudson river at West Point.

The Hudson river separated the New England and northern colonies from the middle and southern portion of the states. Possession of the Hudson by the British would have afforded easy communication and co-operation between the British forces in New York and in Canada and would have permitted the defeat of the colonial forces in detail. Obstruction of the Hudson, therefore, received the earnest attention of General Washington and the Continental congress.

The first obstruction was a line of chevaux-de-frise and sunken ships stretching from Fort Lee to Fort Washington, in a line with what now is 178th street, New York City. This obstruction failed and the British passed it on Oct. 9, 1776, without firing a gun.

A "chain with boom" then was undertaken, to stretch from Fort Montgomery to Anthony's Nose. Most of this chain was produced at or near Ticonderoga where it originally had been intended to obstruct the outlet of Lake Champlain. The need there having passed, the chain was shipped to Van Zante, Lawrence & Tudor, ironworkers at Poughkeepsie. With iron shipped from Col. Livingston's furnace at Salisbury, Conn., additional links were made to complete the crossing of the river. The chain was of bar iron about 1½ inches square, and a memoranda referring to the chain read: "For 600 yards, or 1800 feet of chain, you want 4800 feet of bar iron in length."

The chain was stretched across the river in the fall of 1776 but broke twice. During the winter it was strengthened and it then stayed in place until the British captured Fort Clinton and Fort Montgomery on Oct. 1, 1777.

The following is an excerpt from a book later published in England: "A boom and chain which ran across the river from Fort Montgomery to St. Anthony's Nose, and which is supposed to have cost £70,000, fell into the hands of the conquerors. This chain was of most excellent workmanship. It was sent to England and from there to Gibraltar where it was of great use in protecting the shipping at the Moles."

Washington's Message

The British then captured and burned Kingston and General Washington wrote: "The enemy have already laid waste and destroyed all the houses, mills and towns accessible to them. Unless proper measures are taken to prevent them, they will renew their ravages in the spring, or as soon as the season will admit, and perhaps Albany, the only town in the state of any importance remaining in our hands, may undergo a like fate and a general havoc and devastation take place."

Obstructions in the nature of chevaux-de-frise were set up at Polopel's island, and fireships held in readiness, but these preparations were not completed until about the time the contract was placed for the West Point chain. This contract was signed Feb. 2, 1778, after thorough investigations had been made to determine whether it was possible to make a chain strong enough and at the same time not too heavy to be handled. The contract signed on that occasion is still preserved, and is reproduced elsewhere in this article.

Pig iron for the chain was produced at the Sterling furnace from local ores, was converted into wrought iron at the Sterling forge and the bar iron welded into links. A few links at a time were taken over the mountains on the backs of mules, and were welded together, with swivels and clevises, at several forges along the Hudson near New Windsor and West Point. The chain was 1500 feet long, weighed 186 tons and was completed by April 1, 1778.

Nearly all of the links were of approximately 2¼-inch square bar iron and about 2 feet long. Some of the links,

for use where the greatest strains occurred, were of 3½-inch bar iron and were about 3½ feet long. The stretching of the chain across the river was completed successfully on April 30, 1778. Like the Fort Montgomery chain, it was supported in the river by large logs so that it floated a few feet below the surface. The chain was entirely successful. After the war it was removed and portions of it now are preserved at West Point and other places.

No reference to the Sterling Iron Works is complete without mention of the "dynasty" of Townsends, all famous ironmasters in their days. Henry Townsend moved to Orange county from Long Island about 1735. His son, Peter, became the chief figure in the business sometime prior to the Revolution, when it was conducted as Noble, Townsend & Co. Peter Townsend is said to have produced, in 1776, the first steel made in the province of New York, "at first from pig and afterward from bar iron, in the German manner." He died in 1783 and his son, Peter, carried on the business.

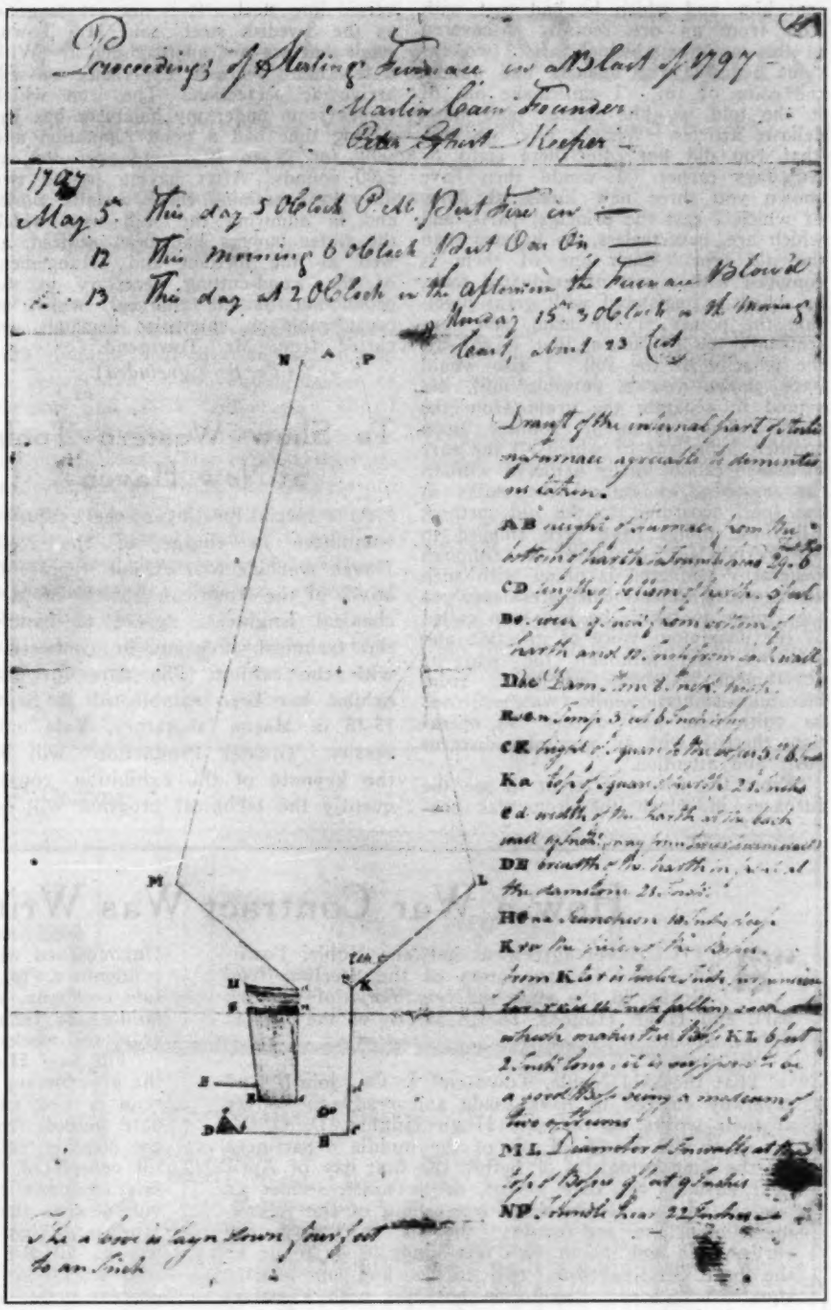
An early record says the second Peter Townsend made, in 1810, the first blister steel produced in the state of New York, but it is assumed by some authorities that the steel made by the first Peter Townsend in 1776 was blister steel. The second Peter Townsend did much to improve the manufacturing practice of his day and made early use of anthracite coal in the blast furnace.

The third Peter Townsend was born in 1803 and died in 1885. He was a striking figure "tall and powerful, weighing over 240 pounds and with a chest measurement of 54 inches." He was beloved by his men and there was no operation in the plant that he could not perform personally.

Frenchman Describes Plant

An interesting account of the Sterling Iron Works as it appeared in 1790 was published later by the Marquis de Crevecoeur who was in the French service during the French and Indian wars and continued in this country during and after the Revolution. He visited various iron works and had the following to say about his visit at Sterling:

"Hardly had we put our horses in the stable, when the proprietor, Mr. Townsend, came out to meet us, and received us with the polish of a man of the world. His hospitality has been for a long time so well known, that, whether one comes from the interior or from New York, one always makes one's plans so as to pass the night with him in going over the mountains. Having been informed that the object of our journey was to examine with attention his different works he offered to show them to us in detail.


Proceedings of a Blast Furnace in a Blast A.D. 1797
Marlin Cain Founder
Peter Townsend Keeper
1797
May 5th This day 5 O'Clock P.M. Put Fire in
12 This morning 6 O'Clock Put On
13 This day at 2 O'Clock in the afternoon the Furnace Blowed
Monday 15th 3 O'Clock in the morning
Last Cast 23 Cwt
Draught of the internal part of the Furnace

"PROCEEDINGS OF THE STERLING FURNACE IN A BLAST, 1797." AS NOTED, THE ORIGINAL RECORD GIVES THE DATES OF CHARGING THE FURNACE AND ALSO A CROSS-SECTION SKETCH AND DIMENSIONS OF THE FURNACE

"First he conducted us to his large furnace, where the ore is smelted and converted into pigs, weighing from 60 to 100 pounds. This furnace was situated at a short distance from a dam, which, through the favorable conformation of the ground, had given him, at little cost, quite a considerable water storage. From a mere brook, he had made a little lake of 15,000 acres." (The actual area of the lake is only 310 acres.) "This furnace was blown by two immense bellows of 48 inches, 2 by 7 feet, which were made entirely of wood, without any iron or leather. The rush and the noise of the wind which they produced resembled a tempest.

" 'This furnace,' said Mr. Townsend, 'produces annually, barring accidents, from 2000 to 2400 tons of iron, of which three-quarters are converted into bar iron and the balance cast into bullets, cannons, etc., for the market. These mountains, the forests of which furnish me with charcoal, furnish also several characters of ore of excellent quality, and known under different names.'

"From there we went to see the forge. Six large hammers were busy forging bars of iron and anchors, as also several parts used in the building of ships. Further down, on the same stream, was a foundry with its reverberatory furnace. He showed us ingenious machines intended for different uses, of which the models had been

sent him, and which he had cast with iron from an ore recently discovered in the mountains, which after two fusions acquired the fineness and almost the color of tin. 'I can make out of it,' he told us, 'the lightest and most delicate articles. What a pity,' he said, 'that you did not come here eight or ten days earlier. I would then have shown you three new kinds of plow, of which I cast the principal parts, and which are, nevertheless, no heavier than the old type. Each one of them is equipped with a sort of graduated scale, by which is registered with great precision the power of the team, and consequently the resistance, that is to say, the tenacity of the soil. I also would have shown you a portable mill, designed to separate the grain from the chaff. This invention follows upon another, by means of which all the ears in a field can be easily gathered without the necessity of cutting the stalks at the foot, according to the old method. All these things have been shipped to Mt. Vernon for,' continued he, 'although General Washington is filling with such distinguished talents the presidency of the Union, to which he has been called by the unanimous voice of affection and gratitude, and although the seat of government is about 300 miles from his fine plantation, he watches over its cultivation, and directs the operations thereof, with an admirable discernment and attention.'

"From the forge we went to see the furnaces in which the iron was converted into steel. 'It is not yet as good as the Swedish steel,' said Mr. Townsend, 'but we are approaching it. With a few more years of experience we will arrive at perfection. The iron which comes from under my hammers has for a long time had a good reputation and sells for 28 to 30 pounds per ton of 2200 pounds.' After having passed two days in examining these various works and in admiring the skill with which the water powers had been utilized, as well as the method and arrangement of the wood-cutting necessary to the production of the charcoal, which so considerable an enterprise demands, we parted from Mr. Townsend."

(To Be Concluded)

To Show Western Tools at New Haven

At a special meeting of the executive committee in charge of the New Haven machine tool exhibit, representatives of the American Society of Mechanical Engineers agreed to handle the technical program in connection with the exhibit. The date for the exhibit has been established as Sept. 15-18 in Mason laboratory, Yale university. "Greater Production" will be the keynote of the exhibition, consequently the technical program will be arranged with that idea in mind. This year efforts are being made to secure representative exhibits of manufactures in the Middle West and already exhibits have been obtained from manufacturers in Cleveland and Cincinnati. The New Haven machine tool exhibit, which is the fourth annual, is held under the joint auspices of the New Haven branch of the American Society of Mechanical Engineers, Yale university and the New Haven chamber of commerce. The growth of the three held previously has been so rapid that it is expected the one this fall will be the largest machine tool exhibit held in America. Through the co-operation of the American Society of Mechanical Engineers arrangements are being made to secure several speakers of national prominence. Information concerning the exhibition is to be obtained from Prof. S. W. Dudley secretary, Mason laboratory, Yale university, New Haven, Conn.

A petition in bankruptcy has been filed against the Murrell Engineering Corp., 1674 Broadway, New York. Liabilities are stated to be about $150,000 and assets about $50,000.

How a War Contract Was Written in 1778

"ARTICLES of agreement between Noble, Townsend & Co., proprietors of the Sterling Iron Works, in the state of New York, of the one part, and Hugh Hughes, D. Q. M. G. of the United States, of the other part,

"Witnesseth:

"That the said Noble, Townsend & Co., jointly and severally engage to have made and ready to deliver at their works, to the said Hugh Hughes, D. Q. M. G., or to the D. Q. M. G. of the middle department for the time being, on or before the first day of April next ensuing the date hereof, or as much sooner as circumstances will admit, an iron chain of the following dimensions and quality, that is, in length, 500 yards—each link about two feet long, to be made of the best Sterling iron, two inches and one-quarter square, or as near hereto as possible, with a swivel to every 100 feet and a clevis to every thousand feet, in the same manner as those of the former chain.

"The said Noble, Townsend & Co. also engage to have made and ready to be delivered at least 12 tons of anchors of the aforesaid iron, and of such sizes as the said Hugh Hughes, or his successors in office, shall direct, in writing, as soon as the completion of the chain will admit.

"In consideration of which, the said Hugh Hughes, in behalf of the United States, agrees to pay to the said Noble, Townsend & Co., or their order, at the rate of £440 for every ton weight of chain and anchors, delivered as before mentioned, unless the general regulations on trade, provisions, etc., which are now supposed to be framed by deputies from the United States shall be published and take effect before the expiration of four months from the date of this; in which case the price is to be only £400 per ton for the said chain and anchors. The payment, if demanded, to be made in such proportion as the work shall be ready to be delivered, which shall be determined in 10 days after requisition made by a number of competent judges, not less than three nor more than five. Unconcerned with the proprietors, or the works, and if condemned, to be completed at the expense of the said company, who are also to repair, as aforesaid, all failures of their work. Whenever happening, whether at the works or river, or in extending it across.

"The said Hugh Hughes also engages to procure of the government of this state, for the said Noble, Townsend & Co., an exemption for nine months from the date hereof, from military duty for 60 artificers that are steadily employed at the said chain and anchors, till completed. Agreeable to the said exemption, the said company complying with the terms thereof; providing, also, that the said company give the said Hugh Hughes, or his successors in office, the refusal, by letter, of all the bar iron, anchors, etc., made at the said works in the said term of nine months, at the current price, less what is necessary to exchange for clothing and other articles for the use of the works. It is also agreed, by the said parties, that if the teams of the said company shall transport the said chain or anchors, or any part thereof, to any assigned post, they shall receive for such services the same pay as shall be given by the United States for the like; the teams of the company being exempted from impress by any of the Q. M. G.'s deputies during the space of nine months.

"Lastly, the said company engage to use their utmost endeavors to keep seven fires at forging and 10 at welding, if assisted with such hands as are necessary and can be spared from the army, in case of their not being able to procure others, the said company making deduction for their labor.

"In witness whereof, the parties have interchangeably subscribed their names this second day of February, one thousand seven hundred and seventy-eight, in the second year of American Independence.

"Peter Townsend, in behalf of Noble & Co.

"Hugh Hughes, in behalf of the U. S.

"In Presence of,

"P. Tillinghast."

Generating Power from Mercury

Operation of Installation of Emmet Mercury Vapor Process Indicates Substantial Economies Are Attainable—Action of Mercury in Boiler and in Turbine Differs Radically from That of Steam

BY W. L. R. EMMET

IN THE mercury vapor process, mercury is vaporized in a boiler at temperatures which can be much higher than those which are practicable with steam. It is then carried through a turbine and does useful work, exhausting into a surface condenser where its latent heat is used to make steam at pressures desirable for use. The condensed liquid is carried back to the boiler preferably by gravity. The characteristics of mercury are such that high temperature can be used without excessive pressure, and the heat of condensation can be delivered at a convenient degree of vacuum and at a temperature suited to making steam at pressures desirable for power uses. The process thus affords means by which the temperature ranges practicable with steam are greatly increased under conditions which afford large gains in efficiency of conversion of the heat energy of fuel into work.

Work on the first mercury turbine, which was installed in the power station of the General Electric Co. at Schenectady, N. Y., was begun in 1915. It was first operated two years later. The second installation was at the Dutch Point plant of the Hartford Electric Light Co.

The equipment at Hartford is designed to operate with 35-pound gage pressure on the mercury boiler, to deliver about 1800 kilowatts from the mercury turbine, and to make steam at 200-pound pressure with about 100 degrees of superheat. The character of the apparatus can best be observed from the drawings reproduced in Figs. 1 and 2. The furnace gases pass in order through the mercury boiler, a mer-

From a paper presented at the spring meeting of the American Society of Mechanical Engineers, Cleveland, May 26 to 29, 1924. The author is consulting engineer, General Electric Co., Schenectady, N. Y.

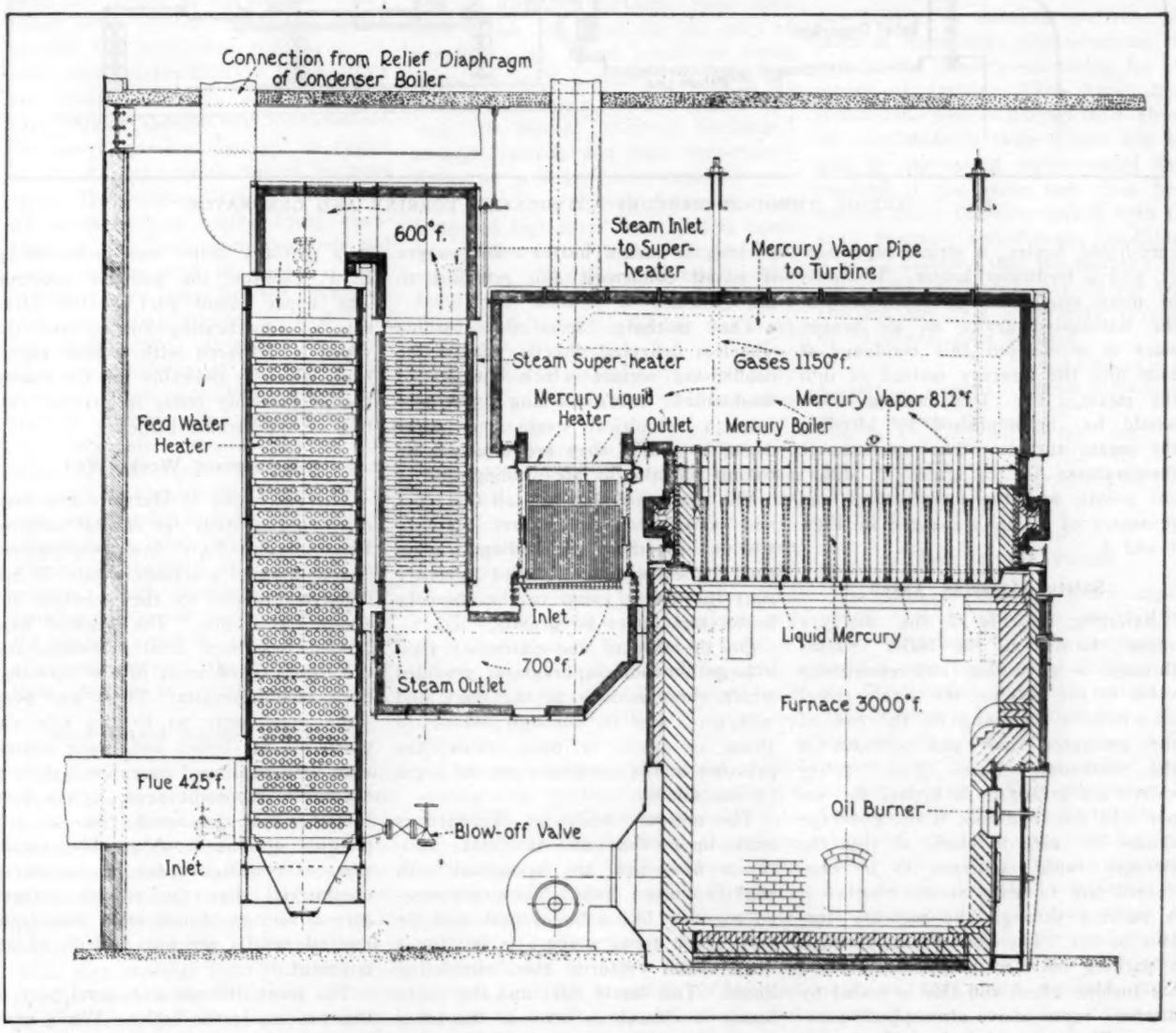


FIG. 1—SECTION THROUGH MERCURY BOILER HEATER, SUPERHEATER AND FEED WATER HEATER

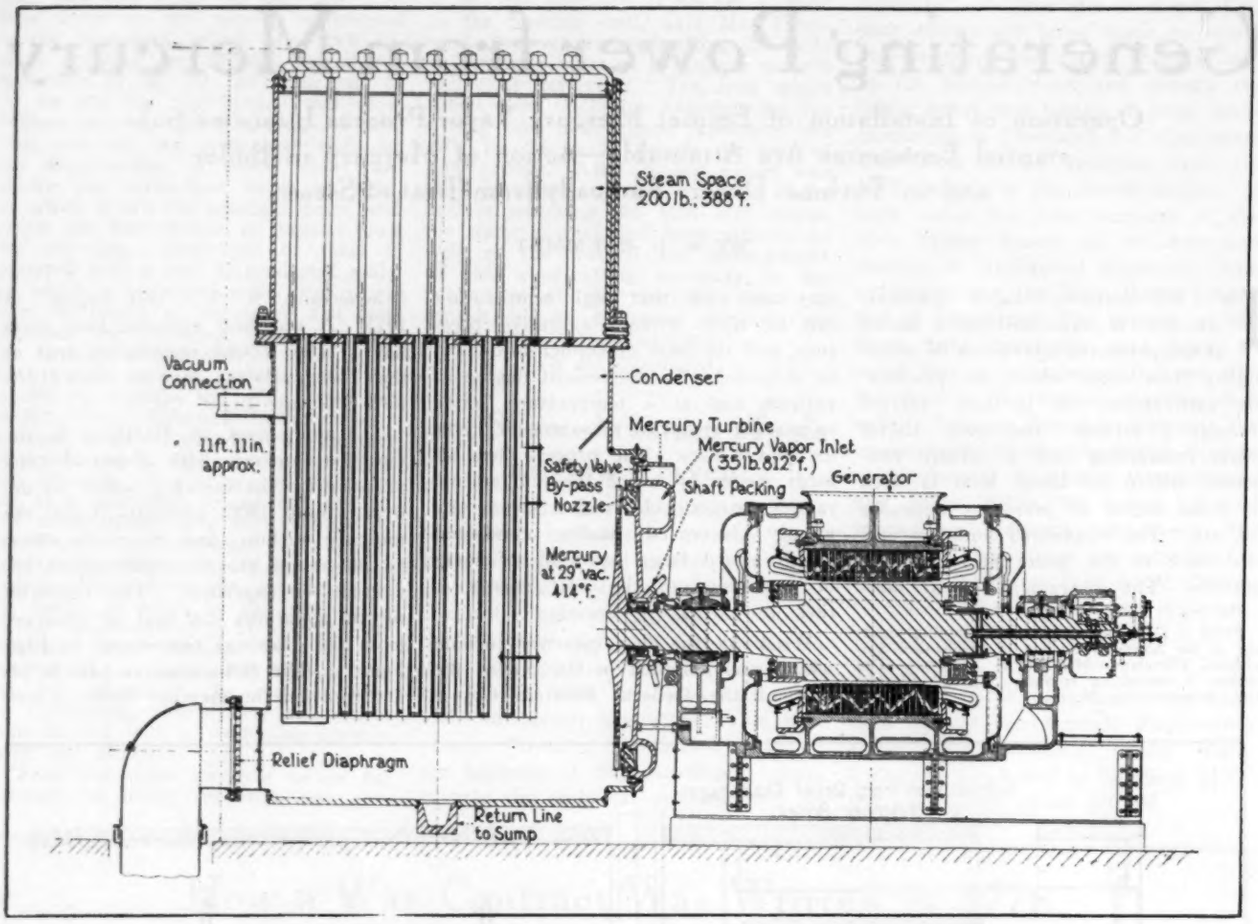


FIG. 2—SECTION THROUGH MERCURY CONDENSER, TURBINE AND GENERATOR

cury-liquid heater, a steam superheater, and a feedwater heater. It would be more economical to substitute for the last-named device an air heater, since it would put this residuum of heat into the mercury instead of into the steam. The feed heating then would be accomplished by bleeding the steam turbine. The approximate temperatures in the gases at different points, and the temperatures and pressures of fluids, are given in Figs. 1 and 2.

Safety Measures Taken

Referring to Fig. 2, the mercury vapor formed in the boiler passes through a governing and emergency valve to the turbine, the single wheel of which is overhung on the end of the generator shaft and operates in the condenser space. Two safety valves are arranged to bypass the vapor into the condenser if the governor causes its valve to close, so that the mercury vapor continues to be condensed and to make steam whether it is passing through the mercury turbine or not. The shaft passes through a packing between the generator and the turbine wheel and this is sealed by mercury vapor above atmospheric pressure. The outward leakage from this packing is sucked into a cooler where it is all condensed and returned to the system.

The discharge from the turbine wheel is delivered directly against the condensing surface which consists of dead-ended tubes hanging vertically from a cylindrical steam and water drum, to which they are attached by rolling and also by arc welding.

The condenser shell and all the pipes and containers which carry mercury are put together by welding. From the condenser the liquefied mercury runs through a sump to the mercury heater and boiler by gravity.

On the side of the condenser shell a large blowout diaphragm is provided which communicates to the stack and will give way if, through escape of steam or water or other cause, the pressure in the condenser should begin to rise unduly.

The mercury boiler at Hartford is made up of fire tubes the lower two-thirds of which are hexagonal with slightly convex faces. These are nested together like a honeycomb and for each seven tubes a space is left for a duct which returns the circulating liquid. This liquid rises and the vapor forms in clearances between the tubes at the corners. The use of such tubes in a mercury boiler was proposed by B. P. Coulson, the author's assistant. The upper round part of the tubes acts as superheating surface and the vapor is delivered with a little superheat, which is desirable for the reason that it probably tends to prevent cutting of the turbine blades.

Equipment Works Well

The equipment at Hartford has been run experimentally for several months. Few troubles have been experienced and nothing of a serious nature. It has delivered power to the circuits for about 800 hours. The highest load carried has been 1500 kilowatts and the load carried most of the time has been 1200 kilowatts. There has been some uncertainty as to the safe capacity of the boiler and, since experience with continued operation has been the most important need, it has been thought best to avoid risk of any possible serious trouble. The conditions of running cannot be considered commercial, but the results secured give a very good indication that commercial results are not difficult of attainment.

The most difficult and novel part of this process is the boiler. While mercury is a good heat conductor, it does

not wet steel and considerable temperature differences are required to deliver heat to it at a high rate. When it begins to produce vapor on the heating surfaces this condition becomes rapidly worse. Successful mercury boilers are dependent upon a rapid circulation of the liquid and the large difference of pressure between the top and the bottom which prevents boiling of the circulating liquid until it is well started on its upward course. That is, the rapid heat delivery must be confined to the part of the surface which is not much disturbed by boiling. Rapid circulation is essential and the spaces for discharging vapor must be so proportioned that the circulation will not be checked by the escape of the vapor. If these spaces are too small the liquid will be given motion like a charge of shot, and prohibitive back pressure will result which will check circulation. The vapor must slip by the liquid, impelling it but not giving it too much velocity.

In the type of boiler which is now considered most promising, these functions are accomplished in dead-ended tubes with interior structures which provide the circulation conditions for each tube independently. These tubes are arranged in such a manner that they receive radiant heat from below, the gases passing upward in rather small and converging spaces between them. The arrangement is such that all tubes receive nearly equal quantities of heat both from radiation and from contact with the gases.

This type of boiler has the advantage that its heating surface is free from expansion strains. It also makes possible the calorizing of the tubes. This process, which was developed in the General Electric Co. research laboratory, aluminizes the surface of the tubes so that they are immune from burning at high temperatures. It is used successfully in petroleum stills at temperatures much higher than those which need concern us in the mercury process. Such treatment will render possible the use of higher pressures in the process, since the pressures already employed approach the point at which iron begins to scale destructively.

Must Guard Against Impurities

Mercury does not oxidize rapidly even when exposed to air at high temperatures, but a small degree of oxidation seems to render the metal adhesive and makes it difficult to separate finely divided foreign matter. Experience has shown that if the scum formed by oxidation accompanied by scale, dirt, cuttings from the steel, etc., is allowed to freely form and circulate in a mercury boiler system, accumulations are likely to occur in interior passages, and that in these accumulations large crystals of red oxide are likely to form, increasing the bulk of solids and causing danger of stoppages. For these reasons it has been found desirable to carefully protect the mercury from frequent or continued exposure to oxygen, and this has been done by filling the boiler and condenser with illuminating gas when they are shut down. Arrangements have also been made by which gas is kept in the cleaning sump and can be kept in contact with the mercury which leaks from the packing, although this small quantity could be cleaned continuously as it returns to the system if desirable. Hydrogen and carbonic oxide are reducing agents for mercury and, working with them, the liquid is not adhesive and cleaning is relatively easy.

Using Mercury in Turbines

In the first ventures which have been made in mercury turbines, single wheels of the impulse type, like the original DeLaval turbines, have been used. This was done for the sake of simplicity, the speed conditions being suited to such a wheel. It was not known how much the mercury might wear the blades. Mercury discharged at high velocity and high temperature does cut ordinary steel rapidly.

It has been found, however, that tempered high-speed tool steel is hardly at all affected under the severest conditions. The Hartford turbine was fitted with buckets of this metal and some of soft steel. Neither has been even slightly affected, and the inference is that a turbine with a plurality of stages and buckets of ordinary steel can be used.

In many respects the problems of mercury turbines are similar to those of steam turbines. The velocities involved, however, are of the order of one-third and the mechanical problems are therefore much easier notwithstanding the high temperature. The single-wheel turbine at Hartford will in a short time be replaced by a three-wheel machine, also overhung inside the same condenser. It is hoped that this will give a fair efficiency and good durability.

The most economical method of operating this process will generally be to get as much heat as possible into the feedwater by bleeding the steam turbine as in the best modern steam practice. Since such units will not be run at heavy overloads, as is common with steam boilers during peaks, it will be practicable to put a large quantity of heat into the incoming air without danger of burning the brickwork, and it is thought that such a device as the Ljungstrom air heater can be used to great advantage in bringing the flue gases to a low temperature and delivering their heat to the furnace. The heat from the furnace will be used to heat and vaporize mercury and to give such superheat to the steam as may be expedient with the steam apparatus used.

With such an arrangement, if we assume 70 per cent efficiency, 70 pound pressure for the mercury cycle, and the most desirable steam conditions, we should be able to operate on base load for about 10,000 B.t.u. from fuel per kilowatt-hour.

In Hartford, where oil is burned and measured and where steam flow and feed are both measured, it has been estimated that if the steam produced were used effectively, the fuel rate would be about 12,000 B.t.u. per kilowatt-hour. This is with only 1200 kilowatt load, a single-wheel turbine of only about 60 per cent efficiency, and with only 22 pound mercury pressure.

For the purpose of giving an idea of possibilities in existing stations, the cases of three large plants—among the best in the country—operating for the month of January, 1924, have been considered. The following table shows the conditions in these plants and the gain in net output which would have resulted if the same fuel had been burned under mercury boilers with the same auxiliary and flue-gas conditions, it being assumed that the mercury turbines with generators are 70 per cent efficient and that a mercury pressure of 70 pound gage is used.

	Plant 1	Plant 2	Plant 3
Capacity in kilowatts	180,000	50,000	100,000
Economizers	No	No	Yes
Steam pressure lb. per sq. in.	219	286	235
Superheat, deg. Fahr.	217	245	200
Load factor, per cent	57	50	50
B.t.u. in fuel per kw-hr.	19,850	19,700	18,250
Gain in output if fuel had been burned under mercury boilers, per cent	65	58	51

Plans for the Future

As soon as certain boiler experiments now in progress are satisfactorily completed, it is proposed to build a new boiler of a different type for the existing Hartford installation. This boiler will be designed for a pressure of 70 pound gage, the design pressure of the present boiler being 35 pound gage. We also intend to build a new three-stage turbine instead of the one-stage turbine now used. When these changes are made it is hoped that this installation will be representative of types which can be repeated indefinitely on a large scale and with such resultant economies as have been outlined in this paper.

Roller Bearings Facilitate Speed

High-Precision Units of the Roller Type Withstand Heavy Load Capacity and Resistance to Severe Shock—Choice of Bearing Depends Upon Operating Conditions and Design—Principle of Construction Is Described

BY D. E. BATESOLE

PRESENT day manufacturing methods constantly are making new demands upon production machinery in the way of increased speed and service. Never before have these demands been recognized as in this day of keen competition and large quantity production. Machines are now called upon to turn out hundreds of duplicate parts where formerly only a single unit was produced in the same time. These modern day requirements make it necessary that each machine be speeded up to its maximum limit and also that every machine be kept in operation day after day without a shut-down for repairs. To answer these demands for maximum speed and service the present day high-precision roller bearing has been developed.

Ancient Roller Is Refined

Roller bearings of one kind or another have been in use for centuries. The Ancients, when it was necessary to move heavy bodies from one place to another, resorted to the wooden roller to lessen their burden. This same principle of operation has been handed down through the ages with many improvements added from time to time until today we have roller bearings which have reached the maximum in refinement and anti-friction qualities. To many, the term roller bearing still brings to mind a crude assembly of long unfinished rollers perhaps bearing directly upon the shaft and possibly held in position by a loose and crudely made cage or retainer. This type of roller bearing has been displaced by roller bearings with parts made to the tenth of a thousandth of an inch in accuracy and capable of running without the least vibration even at high speed.

Requirements of the modern precision roller bearing are many and varied and depend somewhat upon the type of machinery in which the bearing is to be used. In general, a heavy, steady load capacity and resistance to severe shock is essential. If the speed is low, the ordinary type of roller bearing, if well made, will answer these requirements to a certain degree but when high speed must be combined with heavy load capacity, a bearing of extreme accuracy is required. Furthermore, an efficient roller bearing must have a minimum of internal friction, otherwise considerable heat will be generated and the anti-friction advantages of the bearing will be lost. The bearing should not require frequent oiling or greasing but should be capable of running for long periods with a small amount of lubricant on its running parts. It should not develop wear nor looseness even after years of service. In many cases too, it is necessary that the bearing be quiet in operation. All of these requirements are fulfilled by a roller bearing in which extreme accuracy and smooth finish of all surfaces is embodied.

Included in the large number of roller bearings brought out in the past few years is that of the Hoffmann type which relies on a few sturdy parts accurately made rather than upon a large number of individual parts. Essentially it consists of an inner and outer ring or raceway as shown in Fig. 1, a number of solid rollers and a solid two-piece retainer riveted together and used to separate the rollers.

Diameter and Length Is the Same

The bearing is of the short roller type having rollers of the same length as diameter. Its general proportions are therefore those of the ordinary single row ball bearing; the standard type is made in sizes which interchange

The author, D. E. Batesole, is assistant engineering manager, the Norma Co. of America, Long Island City, N. Y.

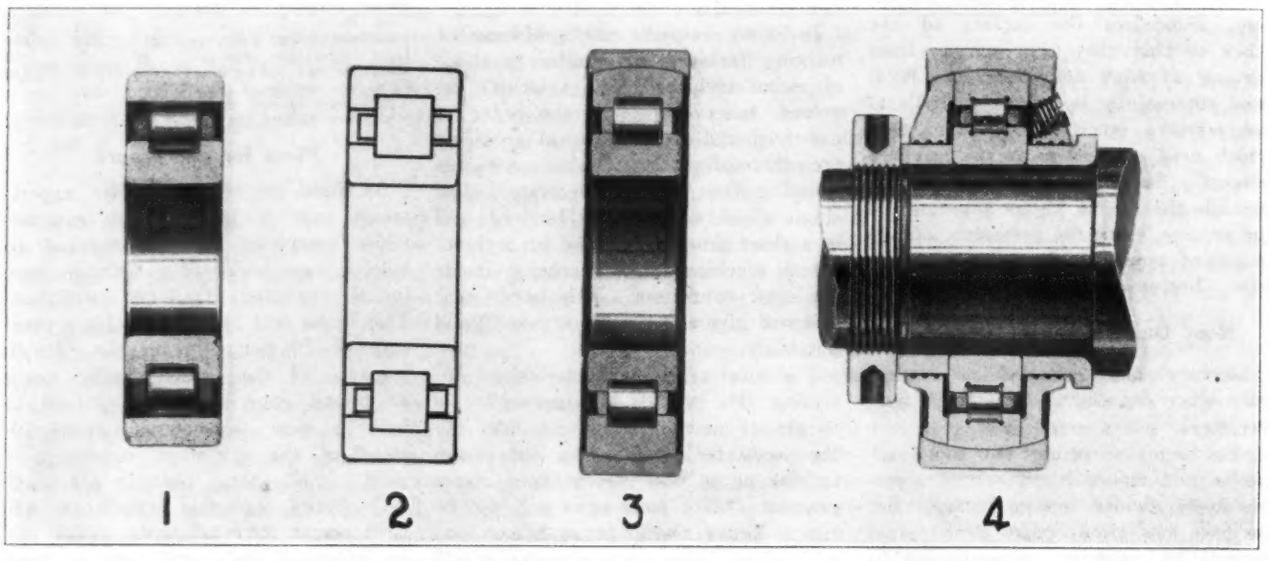


FIG. 1—A BEARING OF THE SHORT ROLLER TYPE WHICH MEETS LOAD AND SPEED REQUIREMENTS. FIG. 2—THIS UNIT, BUILT WITH TWO LIPS IN THE OUTER RACEWAY FORMING A CHANNEL FOR THE ROLLERS, WILL CARRY A SMALL AMOUNT OF LOCATION THRUST. FIG. 3—SELF-ALIGNING ROLLER BEARING. FIG. 4—UNIT SIMILAR TO FIG. 3 BUT EQUIPPED WITH COVER PLATES TO EXCLUDE MOISTURE AND DIRT

with the present S.A.E. standard sizes of ball bearings. A roller of these proportions, namely, square, has been found to offer attractive possibilities for both load and speed. If the rollers are longer than their diameter there is danger that the ends may be chipped off, especially if the roller runs out of parallel with the shaft. The rollers are made of chrome alloy steel to give them the greatest toughness and hardness throughout and are heat treated uniformly. Furthermore they are held to an accuracy of 0.0001 inch in diameter and 0.0002 inch in length and the ends are lapped dead square with the barrel. These same tolerances are employed in the manufacture of the other parts of the bearing as well.

Description of Retainer

The construction of the retainer or cage is shown in Fig. 5. The retainer is made of extruded bronze giving it maximum wear resisting qualities. It consists of the main body of the cage or the part used to space the rollers, and the cover ring, the two being held together by steel rivets. The rollers are carried in milled openings of slightly larger diameter than that of the rollers. The cage so encompasses the rollers that when the bearing outer ring is not in position, the rollers still will be held in the retainer pockets. No pressure is exerted by the rollers against the retainer that would cause the rivets to stretch and the container to separate into its two parts. The bore of the retainer is made only a few thousandths of an inch larger than the outer diameter of the inner ring flanges and its weight therefore is carried on the inner ring rather than on the rollers. This lessens the friction of the retainer on the rollers and permits of higher rotative speed than otherwise would be possible.

Range of Usefulness

The range of usefulness of the precision roller bearing is almost unlimited. Certain conditions require the use of a roller bearing, such as extremely heavy loads, severe shocks and where space is limited. Where it is required to keep the weight of all parts to a minimum such as on airplanes etc. a roller bearing is necessary, since it may be much smaller than a ball bearing of sufficient capacity to carry the same load. However even where the above conditions are not present, a well made roller bearing is usually desirable. It is indeed true that the successful application of high-precision methods of roller bearing manufacture has extended almost indefinitely the field of anti-friction bearings and has opened up new avenues

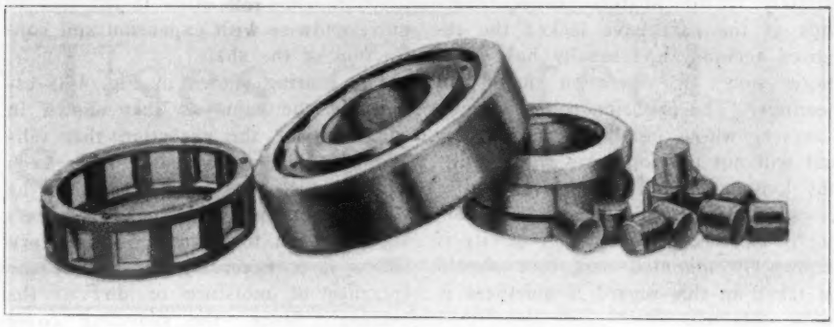


FIG. 5—VARIOUS SECTIONS OF A HIGH-PRECISION ROLLER BEARING

to the important economics to be realized by reducing bearing friction and the resultant high cost of machinery maintenance.

The general impression of anti-friction bearings is that the roller bearing is good for low speeds and the ball bearing for high speeds. The conception of the term speed is, of course, only relative and what may be called high speed with respect to a certain machine may be considered low speed with respect to another type of machine. The precision-type roller bearing has been used successfully both in this country and abroad on airplane superchargers running at many thousand revolutions per minute. The bearings were the smaller sizes, but the larger may be used at speeds in proportion. On woodworking machines such as jointers, shapers, etc., they are being used in considerable quantities at speeds of 7200 revolutions per minute and applications to electric motors running at 3600 revolutions per minute have become common. These speed qualities are the result of the precision and accuracy as built into the bearing.

Many unusual facts covering internal friction have been brought out by recent tests. The Hoffman Mfg. Co., Chelmsford, England, which also manufactures the Hoffman-type ball bearing, had extensive tests made on its ball and roller bearings by the National Physical laboratory. These tests revealed that when loaded to its capacity the Hoffman-type roller bearing has a coefficient of friction lower than that of the corresponding ball bearing and at lower loads is substantially the same as the ball bearing. The demonstration showed that the co-efficient of friction decreased as the load increased. Results of a test performed on a roller bearing follow:

Speed r.p.m.	Load pounds	Coefficient of friction
1300	3970	0.0012
1300	6370	0.0008

The foregoing shows that under heavy loads a high-precision roller bearing is more economical of power than a ball bearing of equal precision under the same loads. It is not necessary to point out here the great difference in friction between the plain or sleeve bearing as against the ball or roller bearing since this fact is today appreciated by everyone.

Quiet operation of a machine often is essential. To run quietly at high speeds a bearing must be made ac-

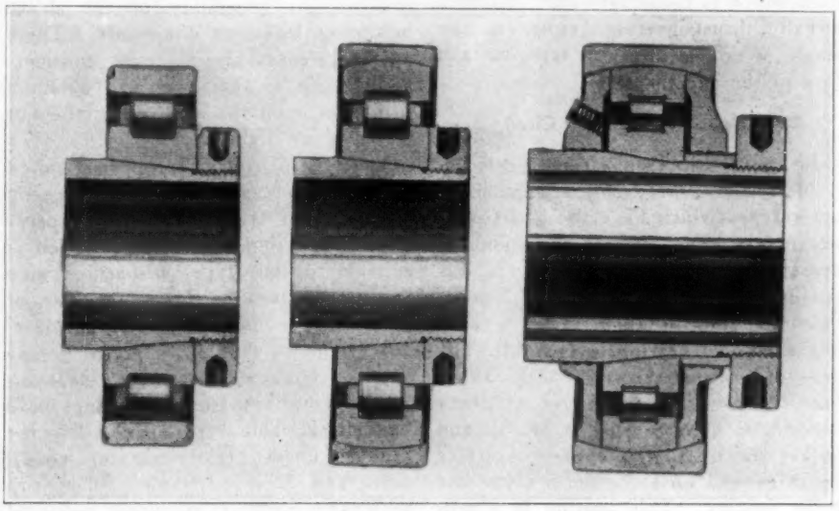


FIG. 6—VARIATIONS OF THE ADAPTER TYPE ROLLER BEARING WHICH IS USED ON LONG SECTIONS OF SHAFTING

curately. Unfortunately roller bearings of the past have lacked the required accuracy and usually have been more noisy in operation than ball bearings. The precision roller bearing, however, when installed runs quietly and will not develop wear with resultant looseness and noise even after years of service. The best made bearing in existence will not run quietly if improperly mounted and care should be taken in this regard if quietness is to be obtained.

The question of end thrust is one which often is brought up when considering the use of roller bearings. The type of bearing shown in Fig. 1 will carry no end thrust because the outer ring has a straight cylindrical raceway without shoulders. The bearing shown in Fig. 2, however, is built with two lips in the outer raceway forming a channel in which the rollers run and will carry a small amount of thrust such as might be termed location thrust. This refers to the condition usually found in ordinary motor operation where there is a pinion or belt drive. If the thrust is of any magnitude, however, some other means should be employed to carry it and the method used will depend largely upon the amount of this end thrust. A number of successful applications are in use at the present time where thrust surfaces are employed to provide endwise location.

A mounting wherein a deep groove annular ball bearing is employed, in conjunction with the roller bearing to take care of the thrust, is suitable for use on motor designs. The roller bearing is used at the pinion or drive end where the loads are heavy and the ball bearing is used at the opposite end to take both the thrust load and the radial load which usually is not large at this point. Another construction, which is commonly used, includes a ball thrust bearing either of the single or double direction type, to take care of the end thrust.

Various Types Are Cited

In addition to the bearings previously described, there are a number of other types which have their particular advantages under certain conditions of operation. In many cases it is impossible to properly align the bearing housings and, in such cases, a self-aligning roller bearing is desirable. The type of bearing shown in Fig. 3 has been designed to take care of these conditions. The bearing is of ball and socket construction, a spherical surface being ground on the outer ring of the roller bearing. This bearing is a self-contained unit and when mounting, one of the bearings is clamped tightly in position while the other is left free to move endwise with expansion and contraction of the shaft.

The bearing shown in Fig. 4 is essentially the same as that shown in Fig. 6 with the exception that self-aligning side cover plates have been added which have necessitated the widening of the outer shell. This bearing has been found to be satisfactory where it is necessary to prevent the entrance of moisture or dirt to the bearing. Since the swiveling cover plates are free to follow the shaft in whatever position it takes, a close running clearance is maintained between the shaft and the bore of the cover plates. In some cases this is held to a few thousandths of an inch and this close clearance in conjunction with the grooves, which are shown in the bores of the cover plates, makes an effective seal against the entrance of foreign matter. The bearing is entirely foolproof and has been used widely where a change-over has been made from a sleeve type to the roller-type bearing since it is not necessary to provide elaborate protecting devices to take care of the bearing. The supply of lubricant is replenished by removing the machine screws from the cover plates and inserting grease or oil, as desired, directly into the bearing.

Must Be Suited to Use

In many cases, such as on long pieces of shafting, it is desirable to use a bearing equipped with a split sleeve or adapter. Several variations of the adapter type of roller bearing are shown in Fig. 6, one of these being fitted with the swiveling side cover plates as mentioned. When mounting a bearing of this type the clamping nut on the sleeve is pulled up tightly and after the bearing has been run for a few days this nut again is tightened to prevent any possibility of the sleeve becoming loose on the shaft. These adapter sleeves are made of considerable length so that they will obtain a firm grip upon the shaft when the nut is pulled up tightly.

The type of roller bearing best suited for a given application will depend largely upon the conditions of operation and design. A bearing which is suitable for one type of machine may be utterly unsuited for a machine of another type and, therefore, considerable thought should be given to the bearing requirements. As a rule manufacturers of anti-friction bearings have had considerable experience with their product under greatly varying conditions and it is advisable to consult with their engineers whenever problems of mounting and use are under consideration.

Suggest Proper Making of Packing Boxes

As a means of preventing loss of goods in transit, John F. Keeley, packing expert of the department of commerce, is conducting in co-operation with the shipping industries an exhaustive investigation on the subject. Tests made at the United States Forest Products Laboratory have shown that the majority of failures of ordinary boxes is due not to the lumber from which the box is made but to improper nailing. In many cases a better box can be constructed with thinner material by the use of a few more nails in the right places, making a material saving in initial cost of packing as well as subsequent saving through less loss in the box car and on the concrete platform.

According to Mr. Keeley the proper nailing of boxes demands the use of the right kind of nails, the right size and the right number. Size and thickness of nails are determined by species of wood and thickness of boards. The woods commonly used for box making purposes have been divided by the Forest Products laboratory into four classes according to their ability to take and hold nails. White pine leads Group 1, southern yellow pine leads Group 2; red gum leads Group 3; and hard maple leads Group 4. The number and size of nails needed to make strong boxes from various woods of different thickness have been reduced to regular rules and charted. Charts from which may be read what nails to use, how many and where for every common kind of box wood have been prepared by the department of commerce, Washington, and are available for distribution.

The number of nails specified for different woods in the chart is not the maximum. Increasing the number of nails 50 per cent will increase the strength of the box 100 per cent on the average. Danger of splits from driving two or three times the number of specified nails is negligible. Nails are cheaper than wood. They serve not only to hold part of a box together, but they provide rigidity. Splitting is caused more often by too large than by too many nails.

Factory employment in New York fell off more than 2 per cent from May to June. Seasonal gains developed in the men's clothing industry and the food industries, but heavy reductions in the metals and other lines caused employment to recede still further after a drop of 7 per cent between March and May.

Large Uses of Steel In Small Ways

MOST users of the phonograph give little thought to the reproducing needle beyond the fact that it functions satisfactorily. But the tiny steel phonograph needle in reality is a precision instrument made to conform to exacting specifications and it is only through the development of ingenious automatic processes of manufacture that its low cost is made possible.

The industry has grown rapidly during the last 20 years and production has doubled from year to year over most of this time. At present, due to the radio and other causes, needle manufacturing capacity is far in excess of demand but the number of needles used each year by the American public still reaches a surprising total. According to one authority 10,000,000 phonograph needles are produced in a day. This corresponds to an annual production in excess of 2,000,000,000. The individual needle, of course does not weigh very much so that this large number when translated into tonnage of steel is not so impressive. According to one manufacturer the average steel needle in use today weighs about 2000 to the pound which would mean that 2,000,000,000 needles would weigh approximately 1,000,000 pounds or 500 tons. This is the weight of the finished product: The process of manufacture requires many operations and the incidental loss of material is fairly heavy. In some plants raw material is received in rods which are drawn into wire before the actual manufacture of the needles starts. For so small an article a loss of 20 per cent is probably conservative. The other figures here given are also thought to be conservative so that the amount of steel used in manufacturing phonograph needles probably was between 600 and 1000 tons in 1923.

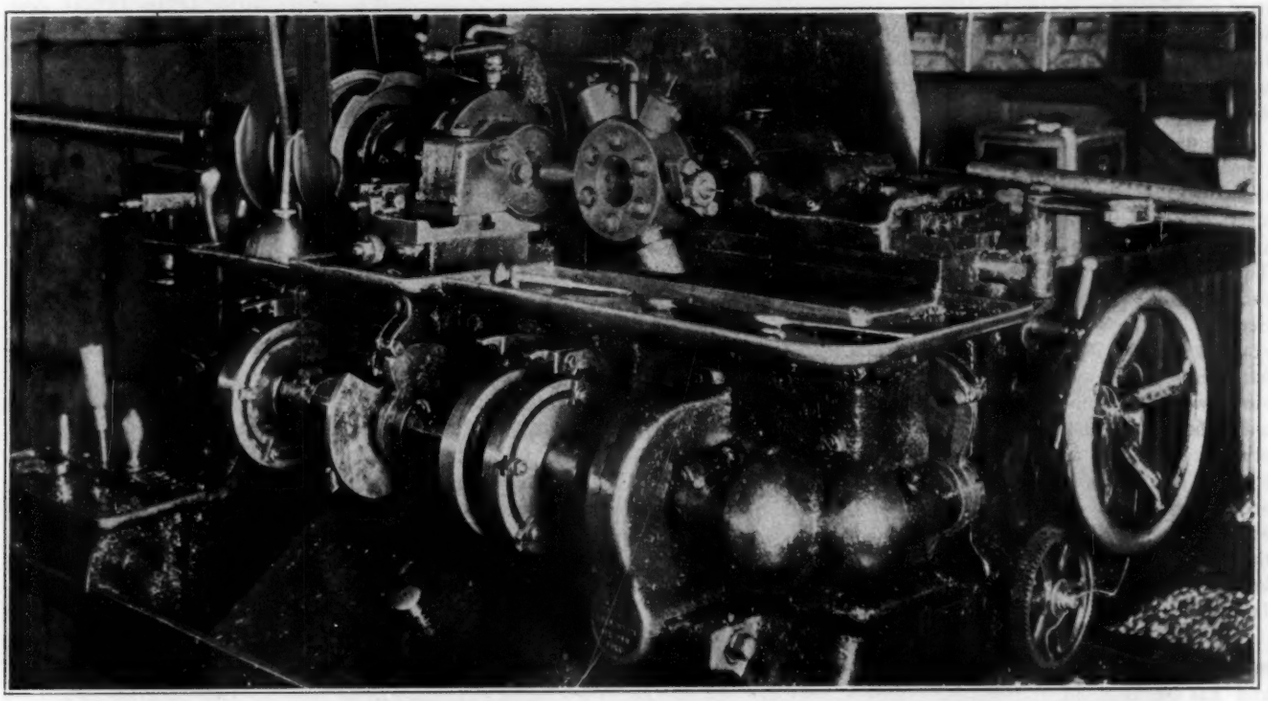
At present the industry is suffering from inroads made by the radio. Those who have become enthusiastic radio fans have been drawn away from their phonographs. This situation is expected to be overcome by a greater national appreciation of music brought about by the radio itself, which it is thought in the long run will react to the benefit of the phonograph.

Phonograph needles are made of high grade carbon steel capable of taking a fine temper. Any good phonograph needle will scratch hard plate glass. Hardness is an essential quality. A more important quality of a good needle is a smooth, rounded point and it is this requirement in design which is the chief distinction between the phonograph needle and the

(*Concluded on Page* 172)

Phonograph Needles

THIS is the seventeenth of a series of articles dealing with some of the thousands of obscure uses of steel which in the aggregate go a long way toward absorbing the great American tonnage, and in proclaiming steel the universal metal. The first article on "Corsets" appeared Nov. 22. Other articles were "Pins," Dec. 6; "Pens," Dec. 20; "Cotton Ties," Jan. 17; "Steel Wool," Jan. 31; "Toys," Feb. 14; "License Plates," Feb. 28; "Spinning Rings and Travelers," March 13; "Hypodermic Needles," March 27; "Card Clothing," April 10; "Shoe Steel," April 24; "Tie Plates," May 8; "Crushed Steel," May 22; "Tacks," June 5; "Skates," June 19; "Knives and Forks," July 5.



IN THE MANUFACTURE OF PHONOGRAPH NEEDLES SPECIAL STEEL WIRE IS CUT TO LENGTH AND GIVEN SHAPE ON AUTOMATIC SCREW MACHINES

Fig. 1—Melter testing the progress of a crucible heat

Manufacturing and Heat Treating Alloy Steel

BY MARCUS A. GROSSMANN

Part I

Application of Alloy Steels and Manufacturing Methods

ALLOY steel manufacture has become so highly specialized in the course of development in the present century, that it may be termed a separate industry. In former years, steel mills classed as special mills were those manufacturing carbon tool steel by the crucible process. Now, however, separate plants manufacture a wide variety of special products, and although larger melting units such as the electric furnace and the open hearth to a large extent have replaced the crucible for making special steels, the methods of manufacture still differ sharply from those employed in tonnage mills.

The underlying causes of this condition are self evident. First, the advantages offered by the use of alloys in steel become available only when the steel is hardened by heat treatment. This necessitates detailed study of the properties developed by heat treatment. Second, the avoidance of breakage or cracking in so drastic a treatment as hardening postulates the use of sound steel, which is difficult to manufacture and which calls for a degree of care seldom employed in preparing tonnage steels. Third, the effects of the alloys are so manifold, and the possibilities in combination so extensive and so varied, that rather comprehensive metallurgical knowledge is required in their manufacture, treatment and use.

Progress made in the industry has permitted widespread use of alloy steels and has resulted in considerable study of new applications, ranging from the commonly used automobile steels, through the various special alloy tool steels, to the most recent studies on stainlessness.

Alloy steels first were used extensively in the manufacture of armor plate. The nickel and nickel-chromium steels found application here, and served to increase enormously the ability of battleships to withstand gunfire. On the other hand, as soon as heat treated armor plate rose in quality, the same principles of treatment were applied to projectiles, which resulted in continuous rivalry between projectiles and armor plate and in an astonishing increase in the efficiency of both.

The development of the automobile has resulted in a further considerable increase in the use of alloy steels. It is a commonplace that the combination of power and lightness in the modern automobile is due in no small degree to the improvements in the mechanical properties of the steels of which they are built. Strengths were easily doubled, so that the weights of axles, drive shafts, and so on, could be reduced correspondingly. These steels, commonly called the automotive steels, contain from 1.50 to 3.50 per cent nickel, or from 0.50 to 1.50 per cent chromium, or about 0.25 per cent vanadium, or 0.3 per cent molybdenum, or generally combinations of two or more of these elements. The steels in common use are the nickel steels, the nickel-chromium steels, the vanadium steels, the chrome-vanadium steels and the chrome-molybdenum steels.

Probably the most startling and unexpected innovation in the use of alloy steels was achieved in the introduction of high-speed steel tools. Machine shop methods and other metal-cutting operations were revolutionized when it became possible to use cutting speeds six times as great as were possible with carbon tool steels. Here again, an unusual heat treatment primarily was responsible in bringing out the usefulness of the alloys. The principal alloying elements in high-speed steel are tungsten which ranges from 14 to 18 per cent, chromium 4 per cent and vanadium which ranges from 1 to 2 per cent. Thus between one-fifth and one-fourth of the total weight of high-speed steel is constituted of alloying elements. This is a higher proportion of alloy than is found in any of the other steels in common use. In addition to the elements named, many others have been used in high-speed steel, sometimes with distinct benefit, as in the case of cobalt, uranium, molybdenum and zirconium. These latter elements are used in comparatively small amount, varying from 0.5 to 4 per cent.

The property of cutting at high speeds is the most striking one that has been imparted to tool steels by alloys, but there are others which on occasion are fully as useful. In the case of the "oil-hardening, nonshrinking" tool steels, for example, the addition of about 1.50 per cent manganese has conferred on the steel valuable new features. The original "plain carbon" tool steels containing no alloying elements were hardened by heating to about 1400 degrees Fahr.—a "cherry red heat"—and then cooling quickly and immediately by plunging them

in cold water. This drastic cooling was necessary, for after any slower rate of cooling they were not hard and could not be used as cutting tools. Now in the manufacture of complicated or delicate tools, such violent cooling as is encountered when red-hot steel is plunged into water, will frequently lead to breakage or at least warping of the tool. The addition of 1.50 per cent manganese has almost completely solved this difficulty, because it then becomes possible to harden the steel by a much milder treatment. The steel is heated as before to about 1400 degrees Fahr., the same "cherry red heat" but it now may be cooled in oil, which is much milder and slower, and yet the steel will be hard when cold. This type of steel has the further valuable property of being almost precisely the same size after hardening and drawing as was the soft piece before the heat treating process. This circumstance makes it possible to manufacture accurate tools. This same type of steel also has been made though perhaps not so successfully with tungsten instead of manganese.

Numerous other special properties are desirable for various types of tool steels. Chisels require a high resistance to failure under repeated blows, yet they must at the same time have a fair degree of hardness. This combination of properties is made possible by the use of tungsten, or chromium, or vanadium, or combinations of these. Special hardness may be required for drills, and this is obtained by the use of chromium. Large amounts of chromium are used, too, in steel dies for the cold-drawing of wire, though such steels generally contain in addition an unusually large percentage of carbon. The "hot-die" steels also must have unusual properties in that they must retain their hardness when gripping hot steel in forging machines, and continue in service without cracking. This generally is accomplished by the addition of tungsten and some chromium although in less severe usage a certain percentage of chromium alone will suffice. In cases where unusual mechanical toughness is required, as for certain punches or dies, it frequently is found useful to add vanadium to a plain carbon tool steel, with no other alloys.

Another large field for the use of alloys is the application of chromium in ball-bearing and roller-bearing steels. These steels must have extremely high hardness and resistance to abrasion. Both the bearings and the balls or rollers are made of steel containing 0.75 to 1.50 per cent chromium. A similar instance is found in the rolls used for cold rolling strip steel.

A considerable tonnage of alloy steels is absorbed also in the manufacture of alloy spring steels. These steels have strength and fatigue properties which never were obtainable with the old plain-carbon spring steels. The result has been a great improvement in efficiency and a decrease in the weight of spring required for a definite load. The spring steels contain various combinations of chromium, manganese, silicon, vanadium and molybdenum.

But it is not alone the mechanical properties of the steels that are affected by the presence of alloys. All properties studied by the physicist and by the chemist are changed in some degree by the presence of alloying elements, so that a suitable selection of alloys may serve to bring out almost any desired properties, even though they be unusual.

Thus the early steels for permanent

Outlines Applications

BECAUSE of the nature of the product, manufacturing alloy steel involves a great many factors not present in making so-called tonnage steel. The producer of special steels cannot stop with the mere making of the steel, but must concern himself with its heat treatment and subsequent handling.

In the accompanying article, the author, who is metallurgist, Atlas Steel Corp., Dunkirk, N. Y., deals with the development of the alloy steel industry, the uses of alloy steels and the methods by which they are manufactured. In next week's issue, Mr. Grossmann will outline the heat treatment of alloy steel.

The illustrations in the accompanying installment are by courtesy of the Atlas Steel Corp. and are from photographs by Bartz of Youngstown, O.

FIG. 2—TAPPING A HEAT OF ELECTRIC FURNACE STEEL INTO THE MOLDS

Properties Imparted to Steel by Various Elements

Alloying Element	Percentage* in the Steel	Properties Imparted	Applications
Chromium	0.50 to 4.00	Hardness	Tool steels, construction steels, armor, bearing steels
	10.00 to 25.00	Corrosion resistance	Cutlery, valves, sheets
	2.00 to 5.00	Magnetic retentiveness	Permanent magnets
Nickel	1.00 to 5.00	Toughness	Automotive steels, armor
	15.00 to 25.00	Corrosion resistance	Corrosion-resistant sheets and rods
	25.00	Electrical resistance	Resistance wire
Tungsten	10.00 to 20.00	Red hardness	High-speed steels
	5.00	Magnetic retentiveness	Permanent magnets
	1.00 to 3.00	Hardness	Tool steels
Manganese	1.00	Hardness	Tool steels, spring steels
	12.00	Toughness	Rails, armor
Silicon	0.50 to 1.00	Hardness	Tool steels, spring steels
	1.00 to 3.00	Corrosion resistance	Cutlery, valves
	10.00	Acid resistance	Chemical containers
Vanadium	0.25	Toughness	Tool steels, construction steels
	1.00	Hardness	High-speed steels
Molybdenum	0.50	Toughness	Construction steels
	1.00	Hardness	Tool steels

*Approximate range.

magnets were plain high-carbon steels. These were supplanted by 5 per cent tungsten steels, which far surpass carbon steels in ability to retain their magnetic qualities. Later 2 per cent chromium steels were found to retain magnetism sufficiently well for many purposes, and were much cheaper than the tungsten steels. Various modifications of these compositions are in use also. The most recent development in magnet steels is a 30 per cent cobalt steel containing tungsten and chromium in addition, which far surpasses in permanence any other magnet steel developed to date. In contrast to the magnet steels, which offer the highest possible resistance to magnetic change, we have at the other end of the magnetic scale the sheets used in transformers, where the resistance to change of magnetic field must be as low as possible. In this case a 4 per cent silicon steel is used. The crystal grains should be as large as possible. Another alloy steel, which has become useful magnetically, is one containing 60 to 75 per cent nickel, which is used on account of its extraordinarily high permeability. For electrical resistance a 25 per cent nickel steel offers desirable qualities at a cost below that of many of the special alloys.

One of the more recent applications of alloys in steel, and one which has become extensive in a comparatively short time, is in the field of resistance to corrosion. The first steels in this field contained about 20 per cent nickel and some chromium. Then the stainless steels came into prominence, especially for cutlery. These contained only chromium, up to about 14 per cent. More recently, many combinations of chromium, nickel and silicon have proven useful and are being adopted. All of these are uncorroded and retain their lustre, especially if polished, in the presence of mild corrosion influences. They do not rust in the air or in the presence of water, nor are they attacked by organic acids in fruit juices, etc., or by the weak mineral acids. They thus find many uses, both industrial and domestic.

Irons containing about 10 per cent silicon are used widely in the chemical industries, as containers for acids and corrosive liquors, and for vessels in which to carry on chemical reactions.

One of the most useful of the simple alloy additions to steel was found in the discovery that one-fourth of 1 per cent copper increases materially the resistance to corrosion of low-carbon sheet steel. This small percentage of copper represents but a trifling cost, interferes in no way with the manufacturing methods, and increases enormously the resistance to corrosion in such applications as roofing.

Numerous other special alloy steels are made and in general they may be classified under the properties imparted by the individual alloys. The more important properties obtained as a result of the presence of the various alloys are summarized briefly in the accompanying table.

Since the presence of alloys in steel causes many variations in its properties, especially in the mechanical ones, it is not surprising to find that the manufacturing processes must be varied accordingly. The basic principles remain the same, but precautions must be taken at all points to secure quality. The term quality is employed to denote soundness, internal cleanliness, homogeneity and uniformity. Bearing in mind that it is at all times the object to obtain these various phases of quality, it becomes simple to trace the variations in manufacture,

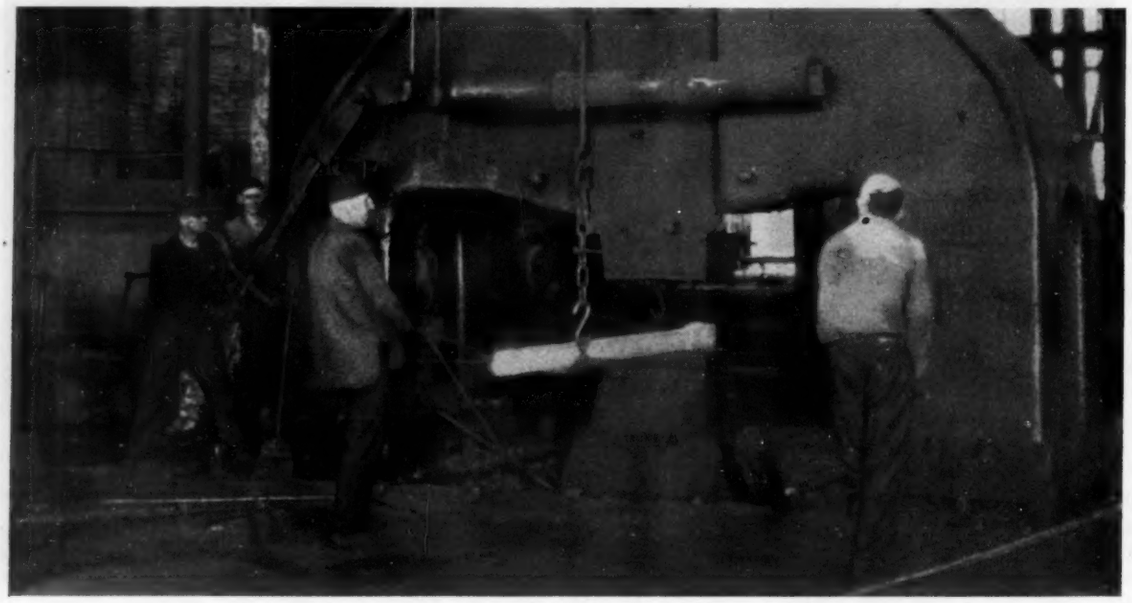


FIG. 3—COGGING AN INGOT OF HIGH SPEED STEEL UNDER A 6-TON HAMMER

in the light of known properties of the alloying elements.

The steps entailed in the manufacture of a finished useful piece of alloy steel may be classified under three heads, namely, melting, mill operations and heat treatment. The melting of alloy steels is carried out in the crucible, in the electric furnace and in the open hearth. In the manufacture of crucible steel, it has been the practice to strive for soundness, cleanliness and uniformity, because the steels manufactured by this process were for the most part tool steels, and were of necessity made with care. No radical departures were introduced when alloy steels entered the field. Modifications, however, were made to insure the uniform distribution of the alloying elements. In making high-speed steel, for example, it became necessary to extend considerably the time of melting to secure complete solution of the difficultly soluble tungsten. In melting chromium steels it is necessary to regulate both the charge and the working of the heat carefully because chromium attacks avidly the graphite pots such as are used in the United States, thus raising the carbon content of the steel. Certain elements cannot be introduced with the regular charge; it is necessary to wait until the steel is melted and refined, and to make the alloy addition shortly before pouring. This procedure is necessary because the alloy oxidizes readily and would partially be lost to the steel if added at the beginning. An outstanding example is uranium; the same property is exhibited in much milder degree in vanadium.

Aside from precautions of the general types heretofore mentioned, the crucible melting of alloy steels proceeds as with carbon steels. In Fig. 1 a melter is shown testing the progress of a crucible heat. A favorite melting unit for alloy steels, especially for the complicated and expensive ones, is the electric furnace. The extraordinary increase in the use of the electric furnace is due largely to the facility with which alloy steels are made in it, and this in turn is due to the ease of control of both its temperature and its slags. The ease of control of the furnace slags is due to the neutral atmosphere and is especially advantageous, for it permits accuracy of control of composition which is not attainable in other methods of melting. It suffers neither from the reducing and carbonizing action of the graphite pot in crucible melting, nor from the oxidizing action of the flame in the open hearth. This affords an opportunity of making a chemical analysis of a sample of the steel after melting, while holding the steel itself unchanged in the furnace. This control of composition is augmented by a complete and accurate recovery of alloy additions, some of which might under less favorable circumstances be lost as slag.

The use of refining slags promotes that cleanliness and purity which is so important for alloy steels, and makes of the electric furnace a highly valuable instrument in the manufacture of fine steels. Finally comes into consideration the melting of alloy steels in the open hearth. When due regard is had for the nature of the alloys in use, it is possible to manufacture many steels by this process and they will be of adequate quality. A large tonnage of the nickel and nickel-chrome steels is melted in this way, as are also many of the other construction steels. The alloying elements are added to the steel bath at a time when the latter is in a suitable state of refinement, and by a judicious

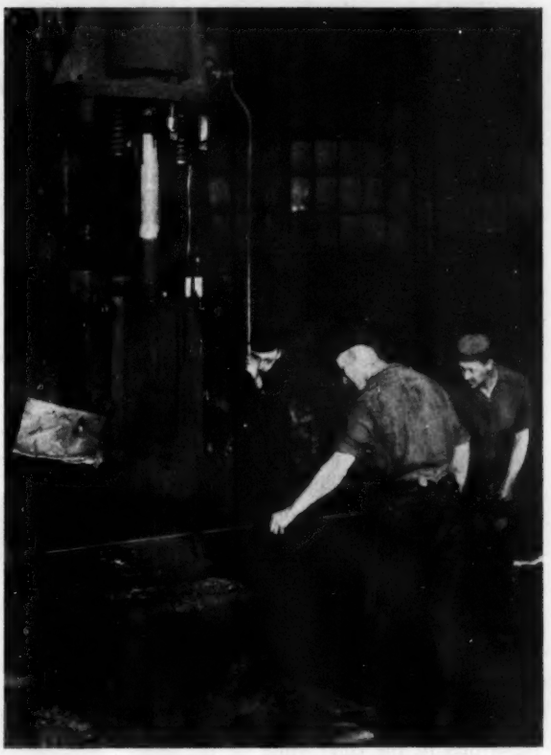


FIG. 5—FINISHING A BAR OF SPECIAL STEEL UNDER THE HAMMER

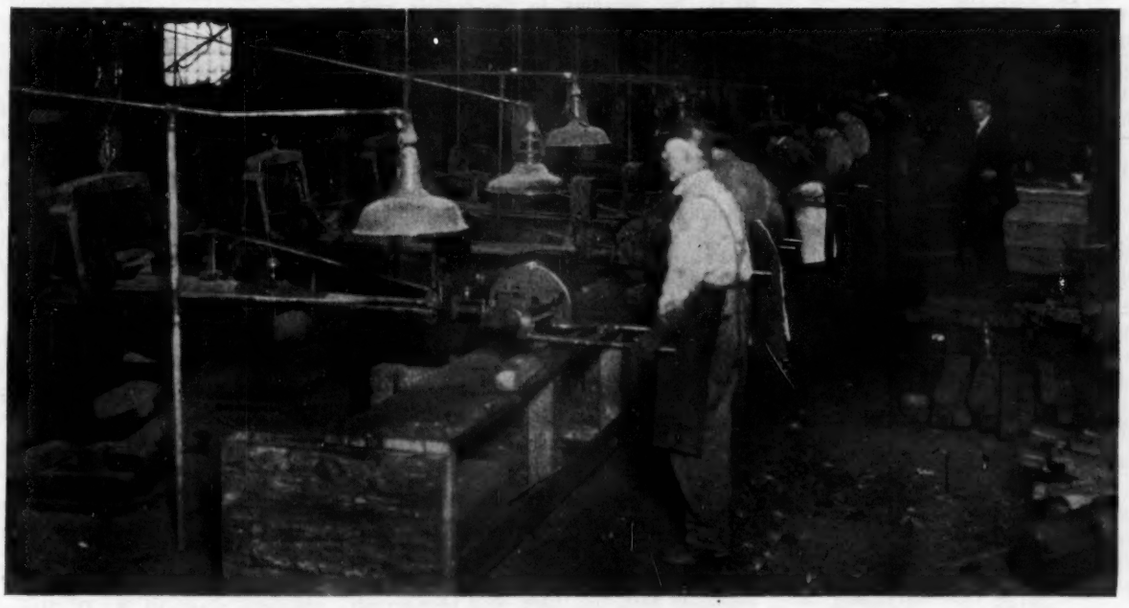


FIG. 4—GRINDING MACHINES FOR REMOVING DEFECTIVE AREAS FROM STEEL BILLETS

use of reducing and refining agents, such as manganese and silicon, it becomes possible to make open-hearth steel of good quality. When open-hearth steel is sufficiently good for the purpose in hand, a saving in cost is effected over crucible or electric steel.

Sometimes a duplex process is used, in which the steel is melted and partially refined in the open hearth, transferred molten to the electric furnace and there given its ultimate refining.

The steel having been melted by one of the foregoing methods, now is cast into ingots suitable for subsequent reduction by forging or rolling. With the improvement in the quality of steel has come a change in the form of ingot mold. The structural steels are in the class of so-called nonpiping steels; that is to say, they do not settle down into the molds on solidifying, nor do they form a shrinkage cavity or pipe. This failure to pipe is due to evolution of gas on solidifying. The quality steels, on the other hand, are made sound and free of gas, and they have a considerable shrinkage cavity at the top of the ingot due to the contraction of the steel as it solidifies. The formation of this shrinkage cavity is avoided by two practices prevalent in the fine steel industry. First, the ingot molds are made wider at the top than at the bottom, so that the shrinkage cavity would be wide and shallow rather than narrow and deep. Second, a reservoir of molten steel is provided at the top of the ingot, which fills the shrinkage cavity as it forms. A small refractory container, called a hot-top, is placed at the top of the ingot mold, to hold this extra supply of molten steel. In Fig. 2, a heat of steel is being tapped from a ladle into ingot molds which are provided with clay hot-tops.

The ingots are now to be reduced to bars or sheets or special shapes, depending on their intended use. The first reducing operation, called cogging, usually can be done in the rolling mill, although some steels must have a first gentle reduction under a hammer, or perhaps under a press.

The cogging operations differ from those carried out on the soft steels in that the alloy steels are heated more carefully and reduced more gently. In the case of the soft steels, it is customary to heat the steel hot, and to roll it down as rapidly as it can be manipulated, with as severe reductions as possible, in a mill that operates rapidly. In general, the alloy steels must be heated with care, often with due regard for the nature of the atmosphere in the heating furnace, and the reduction must at first be carried on gently.

When the steel can be cogged in a rolling mill, it is customary and advisable to have the rolls rotating comparatively slowly, and to reduce the steel in light drafts (amounts of reduction) as it is passed back and forth between the rolls. In other respects, the rolling equipment for special steels is similar to the equipment used for soft steels.

Some steels are too sensitive to be cogged with complete safety in so severe an operation as that of the rolling mill. This is true especially of large ingots of high speed steel and certain high alloy steels. Such steels are given their first reductions under the hammer, because it is convenient to give light blows for the early reductions, increasing the vigor of the blows as the steel is reduced. Fig. 3 shows how a billet of high-speed steel has been cogged in a large cogging hammer. Sometimes, too, a press is used for cogging. The less sensitive the steel, the more safely can a press be used.

Once the ingot of alloy steel has been cogged, it becomes necessary to introduce a procedure which is not required for soft steels. In order to insure soundness, the billets are examined carefully and thoroughly for surface defects, and any imperfect areas that are found are removed by chipping or by grinding. Soundness is necessary, as will be recalled, because in subsequent heat treatment any surface crack would lead to breakage. Great care is taken, then, to insure the complete absence of surface defects. Fig. 4 shows how grinding machines are used to grind out these imperfections. For many steels, pneumatic chipping hammers are used instead of grinders.

The billet now is ready for the finishing operation. This may be carried out by any of the methods which already have been mentioned in connection with cogging. It is generally most economical to do the finishing in the rolling mill; in this process, it is possible to regulate the size more closely. For considerable tonnages of the alloy steels, finishing is invariably done in the rolling mill. In individual cases, it is convenient to finish bars under the hammer. This process is illustrated in Fig. 5 which shows the finishing operation and the testing for size.

Large Uses of Steel

(*Concluded from Page 167*)

familiar household sewing needle. Were it not for the necessity of using a specially shaped point in reproducing from a phonograph record the sewing needle would fill the bill quite as well as the phonograph needle. Under a microscope the point of a phonograph needle looks something like the point of an ordnance shell. In fact, the shape of a phonograph needle closely resembles the shape of the 75-centimeter shell which was a familiar object during the war.

It is fairly easy to produce a straight-sided sharp point but it is another matter to produce in so small an article as a phonograph needle the round tipped point so essential to good tone and to the preservation of the record.

Methods of manufacturing needles differ considerably from one plant to another but all adhere more or less closely to the following sequence. Rods are drawn into wire which is then fed into automatic screw machines where the needles are cut off and turned to approximate shape. The needles then pass to the heat treating department where they are hardened. Sometimes the screw machine method is replaced by a cold-draw process and when this is the case one or more annealing operations are necessary.

The hardened needles are almost invariably polished and brought to accurate dimension through abrasive action of one sort or another. It is a comparatively simple matter to feed a needle or pin at an angle against a revolving abrasive disk and by causing the needle or pin to revolve about its own axis to produce a straight-sided point, but when it comes to having a point conform throughout its entire section to a definite curve, it is readily seen that quantity production is only obtainable through a highly specialized abrasive action. The process of giving a phonograph needle its microscopic rounded point has been developed individually by various manufacturers and the detailed method in each case is closely guarded as a trade secret.

Orders Large Riveter

An unusually large hydraulic riveter is being constructed by R. D. Wood & Co., Philadelphia, for the D. Connelly Boiler Co., Cleveland, to be used in the manufacture of high pressure steam boilers. The riveter is of the split stake type, having an outer stake made of cast open-hearth steel and an inner stake made of a round steel forging, being 40 inches in diameter at the root of the 18 foot 6 inch gap. The riveter head is of the six-power type, exerting powers of 200-170-130-100-70 and 40 tons. The stroke of the riveter die is 12 inches. The top of the forged steel stake is equipped with a special horn made of chrome-nickel steel so that the boiler heads can be riveted to the sheets through a standard size manhole, even when driving the largest rivets. The riveter, which will weigh close to 200,000 pounds, is being manufactured in the enlarged plant of R. D. Wood & Co. at Florence, N. J.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

GEORGE HATTON, managing director of the Earl of Dudley's Round Oak Steel Works, Dudley, England, has been appointed chairman of the Midland iron and steel wages board to succeed the late George Macpherson. The newly elected chairman is a commander of the British Empire, a distinction awarded for services rendered during the war, and has for many years been a member of the council of the Iron and Steel institute. He is regarded as a great authority on the Staffordshire iron trade. The Midland board has the distincton of having maintained peace throughout the industry in the Midland, Yorkshire and South Wales areas for something like 40 years. Mr. Hatton is considered eminently suitable for the chair, having the confidence of the operatives as well as the employers' section.

* * *

Frank C. Anderson, of the International Oxygen Co., Newark, N. J., has returned to New York, after having represented that company in the West.

* * *

W. J. Filbert, comptroller of the United States Steel Corp. and member of the finance committee, has sailed for a vacation in Europe.

* * *

Robert H. Finkernagel, until recently general manager of the Interstate Foundries Co., Cleveland, now is sales manager of the foundry division of the Danville Iron & Steel Corp., Danville, Pa.

* * *

H. R. Phillips, formerly representative in Columbia, S. C., for the Carolina Steel & Iron Co., Greensboro, S. C., has resigned from that connection and joined the Piedmond Iron Works, Inc., recently incorporated at Spartanburg, S. C.

* * *

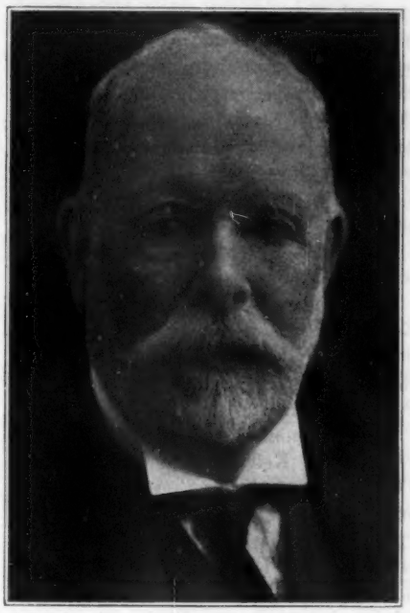
R. J. Younge, recently connected with the United Hotels Co., as manager for Canada, has been appointed general sales manager of the Canadian Car & Foundry Co., Ltd., succeeding D. R. Arnold, who has accepted a position with the Union Metal Products Co., Chicago.

* *

H. L. Mode has joined the sales organization of the Florandin Equipment Co., 110 West Fortieth street, New York, and will specialize in the sale in northern New Jersey territory of hoists made by the American Engineering Co. and cranes made by H. D. Conkey & Co. Mr. Mode formerly was connected with the New York office of the Chesapeake Iron Works, crane manufacturer.

* * *

Edwin C. Stout, sales representative in



GEORGE HATTON

Ohio for the Wickwire Spencer Steel Corp., Buffalo, N. Y., for the past four years, has been appointed sales agent of the spring and specialty department at the office in New York. Prior to Mr. Stout's connection with the Wickwire Spencer Steel Corp., he was associated with the sales department of the American Steel & Wire Co., for 12 years, in Baltimore and New York.

* * *

C. H. Davidson has been placed in charge of the sale of concrete reinforcing bars in the New York district by the McClintic-Marshall Co., Pittsburgh. Mr. Davidson was with the Truscon Steel Co. at Harrisburg. Previous to that he had been with the Corrugated Bar Co. of New York, with the Turner Construction Co. at New York and three years with Fred T. Ley & Co. at Springfield, Mass.

* * *

George M. Jeffrey, 149 Broadway, New York, has been appointed district sales representative of the Eddystone Steel Co. of Crumlynne, Pa., and will handle the sales of that company's output of plain carbon and alloy steel, blue annealed sheets and plates in eastern territory. Mr. Jeffrey entered the employ of the Crucible Steel Co. of America, about 20 years ago. He later went with Hogan & Son, 243 Pearl street, New York and later for 10 years was with the Becker Steel Co. of America.

* * *

O. A. Seyferth, president and general manager of the Fairmount Mining Machinery Co., Fairmount, W. Va., has been elected vice president and general manager of the Austin Machinery Corp., Toledo, O. Mr. Seyferth will not resign from the Fairmount connection, but will spend a few days each month in the West Virginia company's plants.

L. C. England for the past three years assistant manager of the Fairmount company, now will be the active manager.

* * *

Cyril Watts has resigned as secretary of the London Iron and Steel exchange to become secretary of the South Wales Tinplate Corp., Ltd., Bush House, London, which recently was organized by Richard Thomas & Co., Ltd., to control the export business of about two-thirds of the tin mills in Great Britain. Mr. Watts has also been appointed a member of the board of directors of the London Iron and Steel exchange.

J. C. Sumpton has been appointed secretary of the exchange to succeed Mr. Watts. The offices of the exchange are at 123 Cannon street, London.

* * *

Harry J. Swanson has resigned as general sales manager of the Peerless Machine Co., Racine, Wis., which position he had held since 1922. Prior to his connection with the Peerless company, he had been associated with the Detroit Machine Tool Co., Detroit, for six years, holding the position of vice president and general sales manager. His resignation from the Peerless company became effective July 1. He now is vice president and treasurer of the Detroit Piston Pin & Mfg. Co., Detroit, which company has been in existence since March 1, 1922. H. H. Nygren is president of the Detroit Piston & Mfg. Co.

Talk World Power

London Conference Considers Questions of Wide Significance

London, July 7.—The first World Power conference was opened by the Prince of Wales at the British Empire exhibition, London, June 30. Over 30 countries have sent delegates, the American contingent headed by O. C. Merrill, executive secretary of the Federal Power commission, Washington, being specially strong.

The conference has been organized by the British Electrical and Allied Manufacturers' association in co-operation with technical and scientific institutions and industrial organizations in Great Britain and other countries. Over 320 papers will be presented during the proceedings which will last nearly two weeks.

In his speech of welcome the Prince of Wales said in part:

"In the effort to create for industry, and especially power, what the League of Nations intends for politics, lies, I think, the true significance of the World Power conference, and in the belief that something more fundamental than merely technical discussions will result, I extend a cordial welcome to the distinguished representatives who are here. You are all familiar with the main objects of the World Power conference, and have each, in your own degree, contributed to our knowledge of certain aspects, so that it is unnecessary for me to discuss the matter in detail, but there is one consideration which has specially appealed to me. You each represent the views of the main countries of the world on certain questions attached to power, and though your individual views may not necessarily coincide, the mere fact of discussion in an atmosphere of cordial appreciation must do much to tighten those personal contacts which form the inspiring motive of progress in every great activity connected with the modern industrial state, in finance as well as in science, and in research. All three, finance, science, and research, are universal, but the utilization of the results derived from those three activities is not universal, and in this disparity lies one of the greatest obstacles to progress."

The Prince's welcome was acknowledged on behalf of the British dominions by Sir Joseph Cook and on behalf of continental Europe by Guido Semenza, president of the Italian electrical committee, and Mons. Guillame, director of mines for the French government. Dr. M. Kamo spoke for Japan.

O. C. Merrill, responding for the United States and South America, said the conference had assembled to consider power in a new sense and not in connection with national or territorial aggrandizement. Electrical energy, he declared, is the greatest power ever placed in the hands of man. Furthermore, mutual understanding is what the world needs most today and to bring about that understanding contact between peoples rather than between governments counts most heavily.

A number of papers are being presented by Americans, including one entitled "Government Policies Best Adapted to Promote Power Development" by Herbert Hoover, secretary of commerce; and "Power Development from the International Standpoint" by Owen D. Young, chairman, General Electric Co.

Engineers Meet With Power Conference

In connection with the power conference, the British Institution of Mechanical Engineers held a special summer meeting in London to which members of the American Society of Mechanical Engineers who are in Great Britain were specially invited. The meeting was devoted almost exclusively to social activities, including a dinner July 7 and two visits to the British Empire exhibition. A meeting was held July 5 to discuss the proposed standard test code for hydraulic power plants.

The centenary of the birth of Lord Kelvin will be celebrated at the Institution of Civil Engineers, London, July 10 and 11, in connection with the World Power conference.

The ceremonies will include presentation of the Kelvin medal to Dr. Elihu Thomson, American electrophysicist, made by Sir Charles Morgan, president of the Institution of Civil Engineers, July 11. This will be followed by the reception of written addresses from the scientific societies of the British dominions and foreign countries. The Kelvin oration will be delivered by Sir J. J. Thomson. Sir Richard Glazebrook will preside. There will be an exhibition of Kelvin experimental apparatus. A feature will be a banquet Friday, July 11.

Lord Kelvin's work is of particular interest to Americans as it was through him that the first Atlantic cable was converted from failure to success in 1868 and his lectures at Johns Hopkins' university, Baltimore, in 1884 on the "Wave Theory of Light," were epoch-making.

Will Work Ore Deposit

Toronto, Ont., July 14.—Angus Gibson, of Sault Ste. Marie, is arranging to develop his iron ore claims in the Michipicoten district, about five miles from the Helen mine. A deposit of hematite has been disclosed by 2000 feet of trenching and the sinking of shallow pits. Further stripping and trenching will be undertaken, and the depth of the ore ascertained by diamond drilling.

Raw Material Imports in Sharp Decline

Washington, July 15.—A marked decline in imports of raw materials for use in manufacturing was the feature of American import trade for the first quarter of 1924, according to an analysis of the figures for that period just made public by the foreign commerce department of the chamber of commerce of the United States. The analysis shows that textile imports, chiefly raw silk, wool and cotton, alone accounted for $72,000,000 of the $80,000,000 decline below last year's figures.

It is pointed out by the department that "while imports as a whole declined in value for the first three months, some striking gains were made by particular commodities. Imports of wheat showed an increase of 684 per cent over the first quarter of 1923. Grass seeds gained 272 per cent; sugar 18 per cent; spices 16 per cent; tea 16 per cent; fish 43 per cent; creosote oil 95 per cent; Chinese wood oil 87 per cent; crude petroleum 30 per cent; refined petroleum products 19 per cent; nitrate of soda 40 per cent; other fertilizers 17 per cent; clocks and watches 12 per cent; copper ore, concentrates, and matte 71 per cent; unrefined copper 51 per cent; refined coper 10 per cent; tin in bars, blocks, etc., 12 per cent; pulp wood 31 per cent; paper-base stock, except wood pulp 22 per cent; standard newsprint paper 10 per cent; pottery 33 per cent; woven fabrics of flax, hemp, or ramie 26 per cent; and carpets and carpeting 11 per cent.

"Decreases in the value of the imports of many commodities were very severe. Imports of shellac showed a loss of 55 per cent; raw hides and skins were off 52 per cent; flaxseed 39 per cent; leaf tobacco 33 per cent; vegetables and vegetable preparations 28 per cent; cocoanut oil 17 per cent; cocoa 12 per cent; crude rubber 11 per cent. Heavy losses among textile importers were in broad silks 42 per cent; raw wool 32 per cent; wool rags, noils and waste 26 per cent; raw silk 24 per cent; burlap 23 per cent; raw cotton 21 per cent and cotton cloth 17 per cent.

"Comparison of the quantities of various commodities imported brings out decided gains as well as severe decreases. Imports of hay increased 1455 per cent in quantity; wheat 886 per cent; shredded and dessicated cocoanut meat 189 per cent; grass seeds 142 per cent; cotton seed 102 per cent; licorice root 215 per cent; upper leather 116 per cent; cement 201 per cent; lead ore and matte 650 per cent; and manganese ores 322 per cent.

"The most noticeable quantity declines are in coal and coke 83 per cent; pig iron 78 per cent; ferromanganese and other manganese alloys 67 per cent; hides and skins 48 per cent; dried beans 82 per cent; wheat flour 46 per cent; leaf tobacco 44 per cent; quebracho extract 41 per cent; and palm oil 40 per cent."

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

A NEW plant is being constructed for the Cleveland Worm & Gear Co., on East Eightieth street near Kinsman road, Cleveland. Three buildings are to be erected, an office, heavy machine shop, and smaller plant containing the boiler house, etc. The H. K. Ferguson Co., Cleveland and New York, engineer and architect, will build the plant which will have double the capacity of the old location. Equipment for the increased operations already is possessed by the Cleveland company and the only large item to be purchased is a 5-ton traveling crane. The expansion of the company's operations is necessitated by the growth of demand for worm gearing for automotive and general industrial purposes. A. H. Clark is president of the Cleveland company, Howard Dingle, vice president and general manager, Mark L. Thomsen, second vice president, H. C. Robinson, treasurer, and A. C. Blair, secretary.

* * *

DEMAND for its machine for dusting cotton plants to remove the boll weevil has caused the Atlanta Foundry & Machine Co. to add 100 x 200 feet to its plant. Orders for a year's operation are in hand.

* * *

THE Bethlehem Steel Co., Johnstown, Pa., has placed orders with Arthur G. McKee & Co., Cleveland, for McKee-type revolving distributors to be installed on blast furnaces Nos. 10 and 11 of the Bethlehem company's Cambria plant.

* * *

REORGANIZATION of the units of the Western Electric Co., Hawthorne station at Chicago, has been effected, manufacturing, equipment and merchandise departments having been formed. These will function independently. Purchases will continue to be made through R. H. Knaub, Hawthorne plant purchasing agent.

* * *

FRANK M. DAVIS and John Thompson, Milwaukee, who have been manufacturing continuous milling machines and other types of metalworking equipment for several years, have incorporated the business as the Davis & Thompson Co., with a capital of $200,000. Edgar L. Wood, attorney, also is an incorporator. Davis and Thompson formerly manufactured gas engines but in 1918 sold their plant at Fifty-seventh avenue and Mitchell street, to the Avery Co., Peoria, Ill., now defunct, and later developed new multi-purpose, high efficiency types of machine tools. The shop at 251 Reed street has been supplemented by the use of a part of the Avery works, which contain a gray iron foundry and large machine shops.

* * *

MODERN, electrically-operated coal bridges will be installed by William H. Pugh Coal Co., Racine, Wis., within the next three or four months. The frame rigs in use for many years were partly wrecked by a cyclonic storm late in June. The improvement will cost between $80,000 and $100,000. An engineer has not yet been designated.

* * *

THE J. G. White Engineering Corp., New York, has been commissioned by the Staten Island Edison Corp., St. George, Staten Island, N. Y., to design and construct substations at Livingston, Eltingville, Atlantic, Arrochar, Clifton Junction, Donagan Hills and St. George, with transmission line from Livingston to Clifton Junction, and thence to Eltingville and Aarrochar; also power plant addition at Livingston including installation of 15,000 kilowatt unit with necessary auxiliaries. Work will commence in about two weeks.

* * *

A LARGE steam heating station is to be constructed by the Cleveland Electric Illuminating Co., Cleveland, to have an ultimate capacity of 50,000 horsepower. The completed plant is expected to involve an expenditure of approximately $3,500,000. Four brick smokestacks, each 300 feet high, are to be constructed. Powdered coal will be used under the boilers. Three boilers with 1500 horsepower each, operating at an actual horsepower capacity of 13,500 will be used for steam heating.

* * *

STOCKHOLDERS of the Stoughton Wagon Co., Stoughton, Wis., report business of the past fiscal year in excess of $1,740,000, with the motor truck and motorbus department, established several years ago, doubling its business over the previous year. A satisfactory operating profit was reported, and stockholders unanimously voted to place the profit in the working fund rather than declare a dividend, so that the truck business might be developed still more. All directors were re-elected and in turn the directors chose the old officers. F. J. Vea is president.

* * *

UNFINISHED contracts on hand by the George A. Fuller Co., New York, builder and engineer, total close to $20,000,000, according to Hugh White, president of the company. The Fuller company is constructing two plants in Chicago for the Commonwealth Edison Co., involving between $7,000,000 and $8,000,000. The Brotherhood of Locomotive Engineers bank building in Cleveland involves about $4,000,000. The Fuller company is working also on the State Capitol of West Virginia, on an office building in Toronto, and the $10,000,000 Philadelphia Museum of Art, and other large projects.

* * *

AJAX MOTORS CO., recently incorporated with $3,000,000 preferred stock and 30,000 shares no par value common, will constitute the operating company for the plants of the Mitchell Motors Co., Racine, Wis., acquired sometime ago by the Nash Motors Co. All the stock of the Ajax company will be held by the Nash company. No immediate use of the plants is planned, the company being formed to "conduct such business as may be established there in the future." The old Mitchell company plants are bare of all equipment and machinery, the Nash company buying in only the real estate at the auction sale in January.

* * *

PRODUCTION of faucets and fittings for the plumbing trade, already has been started by the Pacific Faucet Mfg. Co., 940 East Sixtieth street, Los Angeles, recently incorporated for $100,000. The Austin Co. recently completed constructing a foundry building, the main plant having been constructed by the Austin Co., and turned over for production purposes on May 10. The plants are fully equipped and contain approximately 50,000 square feet of floor space. Myron J. Glauber is president and general manager of the company, Emma J. Glauber-Black, vice president and treasurer, William J. Black, secretary and Ted Lederer, assistant secretary.

Obituaries

BENJAMIN G. LAMME, chief engineer of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and prominent for many years in the engineering profession, died at his home in Pittsburgh on July 8. He was born near Springfield, O., in 1864 and was educated in county schools in that vicinity. He was graduated from Ohio States university, in 1888, and in May, 1889 entered the employ of the Westinghouse company in its testing department. In 1900 he was made assistant chief engineer, succeeding to the position of chief engineer in 1903, the position he held at the time of his death.

Mr. Lamme was recognized as an important contributor to electrical progress, having been a leader in developing alternating current apparatus and having to his credit over 100 major patents covering electrical equipment. In 1919 he was awarded the Edison medal for that year by the American Institute of Electrical Engineers, in recognition of his many contributions and inventions. In 1923 he was awarded the Joseph Sullivant medal by Ohio State university, from which he had been graduated as a mechanical engineer. He was the first recipient of the medal which is to be awarded once every five years to a graduate of the university accomplishing some notable achievement. Mr. Lamme was appointed by the secretary of the navy in 1915 as a member of the naval advisory board, where he rendered valuable service. He was recommended to the government by the American Institute of Electrical Engineers, after careful survey of its membership. In 1917 he was elected chairman of the inventions committee of the naval consulting board.

His many contributions to industrial and technical publications have made him a conspicuous figure in industrial progress and his valued inventions and improvements rank him as one of the most important contributors to electrical development.

* * *

Frank Lohoff Sr., president of the Evansville Tool Works, Evansville, Ind., died July 3.

* * *

M. C. Reed, head of the Metal & Iron Construction Co., Barnesville, O., died July 7 at his home there at the age of 60 years.

* * *

Christopher R. Corning of Tuxedo Park, N. Y., mining engineer, died recently at Chatelguyon, France. He was 66 years old and formerly was a member of the firm of Olcott, Corning & Peele.

* * *

William H. Hoppe, general manager of the American Circular Loom Co., 90 West street, New York, with a large plant at Kenilworth, N. J., for the manufacture of butt-welded tubing made from cold-rolled strip steel, died at his

BENJAMIN G. LAMME

home in Montclair, N. J., June 24, aged 62. Mr. Hoppe about 30 years ago became connected with R. B. Corey & Co., New York, sales agents of the output of the American Circular Loom Co., and his activities were switched from the selling to the manufacturing company some years ago.

* * *

Henry Theobald, president and general manager of the Toledo Scale Co., Toledo, O., died at his home in that city July 12 aged 57 years. His son, Robert Theobald, is vice president of the Toledo company.

* * *

Samuel R. Sague, 48 years old, president of J. B. Savage Co., Cleveland, printer, and formerly connected with Strong, Carlisle & Hammond Co., that city, mill supply and machinery dealer, died July 9 as result of injuries sustained in a trolley wreck June 6.

* * *

Wilfred Campbell, a leading turbine engineer, died in the hospital at Schenectady, N. Y., July 7, following an operation for appendicitis. Mr. Campbell was born in Manchester, England in 1884 and came to this country in 1907. During the war he was active in research work on submarine detectors and since 1919, had been investigating the action of large turbine wheels. In December, 1923, he was awarded the Chas. A. Coffin medal for meritorious service in the work.

* * *

Edward Martin for 18 years superintendent of the Thomas Sheet mills at Niles, O., until his retirement in 1918 died in New Philadelphia July 11 at the age of 78. Mr. Martin was well known to sheet men in the mid western districts, having been superintendent of the American Sheet & Tin Plate mills at Canton, O., the Ellwood Sheet & Tin Plate Co., Ellwood City, Pa., and the W. A. Thomas Tinplate Co. at Niles.

* * *

William O. Kelly, 59 years old, president of the Kelly-Atkinson Co., Chicago, railway bridge builders, died in a hospital at Cincinnati, July 12, as a result of injuries sustained when a cellar grating gave way under him on the sidewalk at a local hotel. The accident occurred after Mr. Kelly had arrived in Cincinnati from West Baden, Ind. Mr. Kelly's home was in Chicago and he was widely known in the railway bridge construction field for the past 30 years.

To Rebuild Furnace

The American Rolling Mill Co., Middletown, O., has completed arrangements for rebuilding its west blast furnace at South Columbus, O. The present furnace will be dismantled and a new mantle ring, furnace shell and downcomers erected. The top equipment and the McKee-type distributor at present on the furnace will be utilized and re-erected. Arthur G. McKee & Co., Cleveland, engineers and contractors, have been awarded the contract for the entire program.

Steel Men Play Golf

The Steel club of Philadelphia and the Ironmongers association, that city, whose membership comprises the steel and pig iron sellers of the Philadelphia territory, held their annual joint golf tournament July 9 at the Gulph Mills Country club, Swedeland, Pa.

Await Improvement in Machinery

General Betterment Forecast in Equipment Markets Although Present Sales Have Not Been Greatly Accelerated—Many Postponed Purchases Being Brought to Closing Point—Crane Buyers Lapse Into Inactivity

MACHINE tool manufacturers and dealers are awaiting improved demand in the machinery and equipment market. General betterment is foreseen in many districts, but there is little in the way of increased sales or inquiries upon which to base the cheerful outlook. Better sentiment is expected to reflect upon inquiries in the near future, which in turn is expected to stimulate sales.

Included among the industrial companies which are expected to buy equipment during the coming few months are the Universal Portland Cement Co., which is scheduled to close on 18 to 20 machines; the Westinghouse Electric & Mfg. Co., which still is taking tools for its plants at East Pittsburgh and Sharon, Pa.; the Westinghouse Airbrake Co.; the General Electric Co., Carnegie Steel Co., National Tube Co., etc. It is evident that a considerable amount of business is in sight, but the materialization of orders is delayed and postponed until many interests have doubted its veracity, creating, as a result, the tendency to pessimism prevalent in the past few weeks.

Added to the number of machines that the above named industrial companies plan to purchase, are items which several railroads still hesitate to take action on lists long in the market. The Norfolk & Western is closing on 78 tools, many items already having been placed. The Lehigh Valley list still is pending, and the Santa Fe and other middle western and western railroads are expected to be in the market. Miscellaneous railroad buying is more active again, another contributing factor to the increased cheerfulness in the market.

Used equipment demand is featureless, with few cases of increased business. Price concessions still are a leading factor in the used machinery market and many new tool buyers have turned to used equipment for the monetary advantages offered. Dealers in used machinery recently have been heavy buyers of equipment offered at auctions of manufacturing plants. This has lessened the loss of business suffered, but has made price competition keener among the dealers.

Crane activity is considerably slower than in the preceding two weeks when a sudden spurt by builders placed a good amount of business on their books. Awards last week were few and scattered, and inquiries were practically nil. Many inquiries are being worked on quietly, but many of these are merely price feelers and cannot be counted as immediate prospective business.

Prospective Railroad Sales Again Draw Attention

NEW YORK, July 15.—Action has been taken by the Norfolk & Western railroad in closing on its list of 78 machine tools. While the full extent of the purchases has not yet been ascertained, it is understood that the majority of the items on the list have been closed and that action on the remainder will be taken at once. Purchases thus far include engine lathes, it being understood that there were eight of these machines in all, and two or three radial drills; also a driving wheel lathe and spring forming equipment. The bulk of the equipment is for Roanoke, Va. Other railroad buying includes a car wheel borer for the Virginian railway. The Lehigh Valley list still is pending.

Action on at least a portion of the list for the Shibaura Engineering Works, Japan, is expected this week, it being understood that a decision has been reached as to a number of the machines to be bought. While the inquiry involves possibly 150 machines, the full list will not be purchased from machine tool builders. Some of the items inquired for will be supplied from a surplus owned by the General Electric Co., while others will be supplied by equipment owned by the Shibaura works and not seriously damaged by the earthquake. As noted in previous issues, orders will be placed through Mitsui & Co., Ltd., 65 Broadway.

Aside from the Norfolk & Western and Shibaura lists there is little of interest active in the local market. Industrial demand is at low ebb, with a 5-foot radial drill for the American Steel & Wire Co., among the few scattered orders. The General Electric Co., Schenectady, N. Y., is inquiring for a 6-foot radial drill. A slightly better inquiry prevails for overhead cranes, but orders remain small.

Market Generally Improved

CLEVELAND, July 15.—Improvement generally is noted in the local machine tool market although no single indication of betterment is definite. Inquiries are a shade more numerous and involve larger individual expenditures. New York Central railroad inquired for one machine here last week; the Chesapeake & Ohio has entered the market for several tools and the Norfolk & Western is buying against its list. More railroad activity is evident than for a month or more past.

One dealer reports inquiries unusually good last week, and sales also better. That interest closed orders on several inquiries pending for weeks past. Generally it is the larger plants which are buying, companies with limited funds hesitating to decrease working capital in the present business situation.

Westinghouse Electric & Mfg. Co. purchased four or five machines in this district. Libbey Owens Sheet Glass Co., Toledo, which entered the market several months ago for machine tools, is expected to close on eight during the next few weeks. Other small lists which have been pending show more tendency to closing, but definite action still is postponed.

Used equipment demand has not picked up as much as new machinery buying. Few direct inquiries are being received, although shoppers still give appearance of a live market. One dealer is reported as having sold several punch presses last week, but activity generally

was limited to small tools and miscellaneous equipment. Price concessions are still in evidence among used tool dealers, competition being especially keen for local business. Although auction sales of machine tools are cutting into used equipment sales, dealers in that class of product are heavy buyers at the forced liquidations. At the recent sale of the Clark-Mesker Co., manufacturer of milling machines, local and Chicago used tool dealers were among the heaviest purchasers of equipment.

Crane activity is limited to few and scattered sales, builders in this territory not booking as much business as in the preceding month. A few cases of price concessions are met, most weakness being limited to one or two builders who are making an endeavor to obtain a share of the little business going.

Little Activity in Present Market

PITTSBURGH, July 15.—Practically no important machine tool or equipment deals were consummated in this district last week, although a large number of lists are pending and considerable activity is scheduled for early award. The Universal Portland Cement Co., Universal, Pa., within a month or two will buy 18 to 20 machines; the Westinghouse Electric & Mfg. Co., which has been buying now and then for its service departments for East Pittsburgh plant and its Sharon, Pa., transformer plant, will buy additional equipment; the Westinghouse Airbrake Co., Wilmerding, Pa., also will commence on its list at an early date; the Westinghouse Products Co., Mansfield, O., is expected to issue a list soon, and the General Electric Co. may buy some small items for its machine shop addition at Erie, Pa. Other lists pending are those of the Carnegie Steel Co. for Homestead, Pa., and the National Tube Co. for Gary, Ind. The City garage, Pittsburgh, and the Carrick, Pa., high school lists are smaller but likewise will be closed soon. The Great Western Mfg. Co., Leavenworth, Kan., which was negotiating with a few dealers here on used equipment, is understood to have covered its needs in the St. Louis and Kansas City district, buying several hundred thousand dollars' worth to replace equipment destroyed in a recent fire. Typical sales of used equipment here comprise one keyseater, a 30 x 16-foot lathe, and similar items.

The crane market has been quiet after its recent spurt of activity, the Universal Portland Cement Co. having closed on two 10-ton cranes.

See Forerunner of Improvement

CHICAGO, July 15.—Several of the larger machinery dealers have received a slightly heavier run of inquiry and have experienced improved buying of tools off their floors. These inquiries appear to come from small manufacturers who foresee increased business, but their closing will hinge upon improvement in general business. The board of education has awarded the Brown & Sharpe Mfg. Co. three milling machines for installation in Chicago technical high schools, but the placement of the remainder of the board's long machine-tool inquiry has been deferred pending further scanning of bids by the buildings and grounds committee. Practically all of the fair-sized list of tools wanted for a new pipe mill in South Chicago is understood to have been supplied by used machinery dealers.

Simms Foundry Corp., Racine, Wis., is in the market for several square tumbling mills. M. S. Eldred is purchasing agent.

Demand for Production Tools

BOSTON, July 15.—Sales of conventional types of tools remain exceedingly dull throughout New England, but manufacturers of special machines and of production tools report a slight improvement in orders and more interest in inquiry. One Connecticut manufacturer of automobile parts bought six tools during the week totaling over $10,000 and several orders of a similar nature are reported by New England manufacturers. The used tool demand has dropped off during the week and prices are weaker in many places. The sale of tools at the American & British Mfg. Co. plant at Bridgeport, Conn., amounted almost to giving equipment away in many instances. One press valued at $2000 new was sold for $250. Another sale was for four machines valued at approximately $15,000 and placed at $2000. Some half dozen planers, lathes and milling machines are represented in the recent inquiry which comes from a radio manufacturer, a textile mill, an automobile part manufacturer, and one or two general machine shops.

Future Prospects Encouraging

CINCINNATI, July 15.—Another quiet week has been passed by the machine tool trade. Orders all have been small. The Cincinnati Planer Co. reports the sale of a planer to a manufacturer at Hamilton, O., and two more machines in the Pittsburgh district. Encouragement is felt for future buying and it now begins to look as if the railroads will start to buy groups of tools for various shops on their recent lists, bids on which have been in process of tabulation for several weeks. While it is not expected that the third quarter will be as good as the first from a machine tool selling standpoint, dealers believe it will be better than the past month or two.

The condition of the used machinery market continues about the same. Sales have been rather light and inquiries in many cases have fallen off. Considerable used equipment is available in this district.

Crane Awards and Inquiries of the Week

Orders Placed

Six cranes as noted last week for the South Western Portland Cement Co., Dayton, O., to the Northern Engineering Works.

Three 2-ton special overhead cranes for the National Silk & Dyeing Co., Paterson, N. J., to the Shepard Electric Crane & Hoist Co.

Two 10-ton cranes, 45-foot and 57-foot span, respectively, for the Universal Portland Cement Co., Universal, Pa., to the Pawling & Harnischfeger Co.

Two 5-ton electric cranes for the Edward G. Budd Mfg. Co., Philadelphia, to an eastern builder.

Single Installations

75-ton electric crane, 55-foot span, for the Miami Light & Power Co., Miami, Fla., noted in last week's issue as informally placed through Florida East Coast railroad, to an eastern builder.

30-ton, 4-motor crane, 61 foot span, for the Sioux City Gas & Electric Co., Sioux City, Ia., reported placed with the United Gas Improvement Corp., Philadelphia.

10-ton steam shovel, crawler type, for an Albany, N. Y., contractor, to the McMyler-Interstate Co.

10-ton handpower crane, 27-foot span, chain fall type, for Village of Morrisville, Vt., to unnamed builder.

5-ton handpower crane, 27-foot span, for the Heintz Mfg. Co., Philadelphia, to unnamed builder.

Orders Pending

10-ton electric crane, 83-foot span, for the Fitzgibbons Boiler Co., New York, previously noted as pending, to be awarded at once.

5-ton traveling crane for the Cleveland Worm & Gear Co., Cleveland, pending.

Electric cranes for the Johnstown, Pa., and Lackawanna, N. Y., plants of the Bethlehem Steel Corp.; bids asked.

Recent Industrial Business Changes

BISHOP, FRIEDMAN & BERGSTROM, INC., dealers in iron and steel scrap, have discontinued their Philadelphia offices and will conduct business in that district from the offices at Coatesville, Pa. This decision, it is said, followed the retirement of J. V. S. Bishop as an officer and director of the company. Mr. Bishop together with John R. Disch and Harry R. Bishop, will continue in the scrap brokerage business in Philadelphia under the name of Bishop & Co. Their offices will be in the Real Estate Trust building.

* * *

Stabryte Steel Co., Buffalo, N. Y., has filed papers of dissolution.

* * *

Chicago Concrete Machinery Co., Chicago, has been dissolved.

* * *

Stork Motor Co., Saginaw, Mich., has changed its name to the Stork Mfg. & Engineering Co.

* * *

Twin Fire Spark Plug Co., Detroit, incorporated for $40,000 has been dissolved.

* * *

Reeves & Skinner Machinery Co., Newburgh, N. Y., has been dissolved.

* * *

King Sewing Machine Co., Buffalo, N. Y., has changed its name to the King Mfg. Corp.

* * *

T. W. D. Tractor Co., St. Clair, Mich., incorporated for $100,000, has been dissolved.

* * *

Sill Stove Works, Rochester, N. Y., has changed its name to the Sterling Range & Furnace Corp.

* * *

Dearborn Chemical Co., Chicago, has moved its general offices to the Straus building, 310 South Michigan avenue, that city.

* * *

Stimpson Computing Scale Co., Louisville, Ky., and Detroit, capitalized at $535,000 has filed dissolution papers.

* * *

Wyckoff Drawn Steel Co., Pittsburgh, manufacturer of cold-finished steels, has moved its office in Dayton, O., to new quarters at 1045 U. B. building. The Dayton office is in charge of George H. Rehling, district manager of sales.

* * *

George W. Manning Broom Machine Mfg. Co., Grand Rapids, Mich., with a capitalization of $30,000 has filed papers of dissolution.

* * *

C. Davis & Co., Pittsburgh, iron and steel scrap dealers, announce the removal of their offices from the F. Jones building to the Union Trust building, that city.

* * *

The Aetna Steel & Iron Co., Southington, Conn., has purchased the plant of the Aetna Nut Co., and plans operation of one of the bar mills shortly.

* * *

The American Abrasive Co., Westfield, Mass., has purchased the plant of the National Abrasive Co., Amesbury, Mass. Operations have begun in the newly acquired property.

* * *

A. L. Nichols, Nichols, near Appleton, Wis., who has been manufacturing automobile specialties for some time, has incorporated the business as A. L. Nichols, Inc., with $95,000 capital stock. Hugh H. Nichols and Jacob Hahn are associated with him.

* * *

George L. Eastman Co., Los Angeles, iron and steel dealer and manufacturer's representative, has taken over the sole agency for that district in the sale of steel sash manufactured by David Lupton's Sons Co., New York and Philadelphia.

* * *

The Ruggles Motor Truck Co., London, Ont., which suspended operations a few months ago, has been taken over by the parent company the Ruggles Co., Saginaw, Mich. The plant recently was reopened with John Bridge as general manager.

* * *

Strom Ball Bearing Mfg. Co., Chicago, formerly the United States Ball Bearing Mfg. Co., announces the opening of a distributing station at 2322 South Michigan avenue, that city, for the convenience of automobile and truck dealers, fleet owners, etc. A complete stock for replacements will be carried.

* * *

The Monongahela Tube Co., Pittsburgh, announces the opening of a district sales office at 425 West building, Houston, Tex., under the direction of Craig Geddis. Mr. Geddis will have charge of the company's oil country tubular goods and boiler tubes in Texas, Louisiana and Arkansas.

* * *

The Colby Steel & Engineering Co., Central building, Seattle, has purchased the patents of the Barlow marine elevator and will manufacture such a product in Seattle and elsewhere. The Powell River Co., Powell River, B. C. has placed an order with the Colby Steel & Engineering Co., Seattle, for two 10-ton marine elevators.

* * *

The Cleveland Duplex Machinery Co., Penton building, Cleveland, has been appointed the exclusive representative for the Cleveland territory by the J. F. Burr Machine Tool Co., Detroit, manufacturer of chucking, drilling, reaming and other machinery. The Cleveland Duplex Machinery Co. succeeds George J. Keller as Cleveland representative.

* * *

The Hyman-Michaels Co., Chicago, dealer in new and relaying rails, iron and steel scrap, etc., has discontinued its Detroit office, having consolidated that branch with its Pittsburgh agency under the supervision of Morris N. Landay. Mr. Landay has been connected with the Hyman-Michaels Co. in the Pittsburgh and valley districts for many years.

* * *

Central Iron & Steel Co., Harrisburg, Pa., manufacturer of steel plates, has appointed C. A. Fischer, with offices at 303 Keystone building, Houston, Tex., and 1918 W. T. Waggoner building, Fort Worth, Tex., as its district representative. Mr. Fisher and his organization will handle the sale of steel plates and stampings of the Central company in the districts surrounding his offices.

New Construction and Enterprise

BIRMINGHAM, ALA.—New York interests are inquiring here for accommodations to locate a wood screw manufacturing plant. Negotiations are being handled by the local chamber of commerce.

STRATFORD, CONN.—The Bridgeport Rivet Mfg. Co. has been incorporated for $50,000 by William J. Buckley and others of Bridgeport, Conn.

COLUMBUS, GA.—Columbus Iron Works was damaged by fire recently with most of loss being confined to the boiler room and power house.

NAMPA, IDAHO—Options have been signed by the Pacific Fruit Express Co. for 101½ acres of land adjoining the Oregon Short Line property where its plans constructing a car shop costing not less than $450,000.

ALEDO, ILL.—The Aledo Machine Co. has enlarged its shop capacity recently through the addition of several new machines.

CHICAGO—The American Oven & Machine Co., 111 West Washington street, is having plans drawn by Richard Griesser, 64 West Randolph street, for a new plant.

Where additional information is presented, reference is made to date of issue in which previous items appeared.

CHICAGO—Steel Form Service Co., 53 West Jackson boulevard, has been formed with $40,000 capital to manufacture and deal in building materials by George L. Dickson, F. H. Uriell and Fletcher Lewis.

CHICAGO—Mailey Sales Co., 2020-32 Wabash avenue, has been incorporated for $20,000 to deal in automobile accessories and machinery, by Sam Weisman, James Mailey and Louis E. Foncher.

CHICAGO—Watson Zajac, Inc., 326 West Madison street, has been incorporated for $20,000 to manufacture and deal in machinery, tools and equipment, by E. M. Keating, Don Kenneth Jones and Richard Hoffman.

CHICAGO—Bruns & Collins, Inc., 2450 Cottage Grove avenue, has been formed with $30,000 capital to manufacture and deal in automobiles and accessories, by L. J. Berg, J. P. Walsh, and George T. Clark.

CHICAGO—The Wizard Battery Co., 2212 South Wabash avenue, has been incorporated for $2000 to manufacture and deal in storage batteries and automobile accessories, by Joseph Tenneboum, Max Goldberg and S. A. Hyman.

CHICAGO—Mau & Obrien, Inc., 2416 South Michigan avenue, has been incorporated with 200 shares no par value stock, to manufacture and merchandise auto lamps and accessories, by Harry A. Biossat, T. C. Frederich and Bellie MacDowell.

CHICAGO—Four Drive Tractor Co., 29 South LaSalle street, has been incorporated for $500,000 to manufacture and build tractors, road machinery, farm implements, etc., by

Warehouse Steel Prices

Quotations at Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.21c
Detroit	3.25c
Los Angeles	3.75c
New York	3.34c
Philadelphia	3.10c
Pittsburgh	3.00c
San Francisco	3.75c
Seattle	3.50c
St. Louis	3.25c
St. Paul	3.35c

IRON BARS

Boston	3.365c
Buffalo	3.35c
Chicago	3.10c
Cincinnati	3.40c
Detroit	3.25c
New York	3.34c
Philadelphia	3.10c
St. Louis	3.25c

REINFORCING BARS

Boston	3.25c to 3.50c
Buffalo	3.40c
Chicago	2.35c
Cincinnati	3.40c
Cleveland	2.66c to 3.21c
Detroit	3.25c
Los Angeles, C. L.	3.60c
Los Angeles, L. C. L.	4.00c
New York	3.00c
Philadelphia	2.30c
Pittsburgh	2.30c to 2.40c
San Francisco, C. L.	3.65c
San Francisco, L. C. L.	4.00c
Seattle	3.50c

STANDARD STRUCTURAL SHAPES

Boston	3.465c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.31c
Detroit	3.35c
Los Angeles	3.85c
New York	3.44c
Philadelphia	3.10c
Pittsburgh	3.10c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.35c
St. Paul	3.45c

PLATES

Boston	3.465c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.50c
Cleveland, ¼-inch and thicker	3.31c
Cleveland, 3/16-inch	3.55c
Detroit	3.35c
Detroit, 3/16-inch	3.45c
Los Angeles	4.00c
New York	3.44c
Philadelphia	3.10c
Philadelphia, 3/16-inch	3.32c
Pittsburgh	3.10c
San Francisco	3.75c
Seattle	3.50c
St. Louis	3.35c
St. Paul	3.45c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.515c
Buffalo	4.05c
Chicago	3.90c
Cincinnati	4.00c
Cleveland	3.55c to 3.76c
Detroit	4.05c
Los Angeles	5.00c
New York	4.14c
Philadelphia	3.90c
San Francisco	4.50c
Seattle	4.75c
St. Louis	4.00c
St. Paul	4.15c

NO. 28 BLACK SHEETS

Boston	5.00c
Buffalo	4.75c
Chicago	4.70c
Cincinnati	4.65c
Cleveland	4.45c to 4.55c
Detroit	4.75c
Los Angeles	6.20c
New York	4.75c
Philadelphia	4.95c
San Francisco	5.50c
Seattle	5.75c
St. Louis	5.00c
St. Paul	4.95c

NO. 28 GALVANIZED SHEETS

Boston	6.00c
Buffalo	5.85c
Chicago	5.60c
Cincinnati	5.85c
Cleveland	5.55c to 5.65c
Detroit	5.85c
Los Angeles	7.00c
New York	5.75c
Philadelphia	6.00c
San Francisco	6.35c
Seattle	6.75c
St. Louis	5.75c
St. Paul	5.75c to 6.00c

BANDS

Boston	4.115c
Buffalo	4.15c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.96c
Detroit	3.90c
Los Angeles	4.65c
New York	4.09c
Philadelphia	3.85c
Pittsburgh	3.70c
San Francisco	4.25c
Seattle	4.50c
St. Paul	4.00c

HOOPS

Boston	5.60c
Buffalo	4.50c
Chicago	4.25c
Cleveland, 1-inch and wider No. 20 and heavier	3.96c
Cleveland, narrower than 1-inch	4.46c
Detroit	4.40c
New York	4.59c
Philadelphia, ¼-inch and wider, 20 gage and heavier	4.10c
Philadelphia—narrower than ¼-inch	4.60c
Pittsburgh	3.70c
Seattle	5.50c
St. Paul	4.80c

COLD FINISHED STEEL

Boston (rounds)	4.25c
Boston (shapes)	4.75c
Buffalo (rounds)	4.30c
Buffalo (shapes)	4.80c
Chicago (shapes)	4.40c
Chicago (rounds)	3.90c
Cincinnati (rounds)	4.15c
Cincinnati (shapes)	4.65c
Cleveland (rounds)	4.10c
Cleveland (shapes)	4.60c
Detroit (rounds)	4.20c
Detroit (shapes)	4.70c
Los Angeles (rounds)	5.75c
New York (rounds)	4.25c
New York (shapes)	4.75c
Philadelphia (rounds)	4.15c
Philadelphia (shapes)	4.65c
Pittsburgh (rounds)	3.90c
Pittsburgh (sq. hex. and flats)	4.40c
San Francisco (rounds)	5.50c
Seattle (rounds)	5.00c
St. Paul (rounds)	4.15c

WELDED PIPE

Discounts from warehouse, New York City

Standard Steel Pipe
(Subject to Shading)

	Black	Galvanized
¼-⅜-inch butt	—31	+ 2
½-inch butt	—41	—24
¾-inch butt	—46	—32
1/3-inch butt	—48	—34
3½-inch lap	—44	—30
7-8-inch lap	—41	—11
9-10-inch lap	—35	— 8
11-12-inch lap	—34	— 6

Wrought Iron Pipe

	Black	Galvanized
¼-⅜-inch butt	+44	+78
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1-1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
3-6-inch lap	—11	+ 6
7-12-inch lap	— 3	+16

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago**
San Francisco
Cincinnati **Detroit**

Vernon A. Vanhorn, Charles Houston and Alexander L. Sarran.

CHICAGO—Western Equipment Co., 209 LaSalle street, has been incorporated with 225 shares no par value stock, to deal in machinery and equipment, by Charles V. Ricks, Charles B. Fullerton and Joseph P. Oleary.

DANVILLE, ILL.—Modern Machine Shop, Inc., 22 East Harrison street, has been incorporated for $55,000 to manufacture and deal in machinery and mechanical appliances, by Charles E. Carter, Clarence F. Carter and John A. Miller.

EVANSTON, ILL.—North Shore Automobile Co., 1735 Benson avenue, has been incorporated for $40,000 to manufacture and repair motor vehicles, accessories, etc., by Harry Salvat, Earl P. Russell, and Henry J. Neumeister.

JOLIET, ILL.—Faber Spark Plug Co., Inc., 119 South Joliet street, has been formed with $500 capital to manufacture and deal in spark plugs, hardware, machinery, etc., by Alvin J. Faber, Max Singer, and Leo Lasker.

PARKRIDGE, ILL—Jacobson Motor Co., 27 Prospect street, has been incorporated for $25,000 to manufacture and sell automobile supplies, by Veder Jacobson, Walter C. Ballou and Hans Jacobson.

RUSHVILLE, ILL.—Rushville Motor Co., has been incorporated with 100 shares no par value stock to deal in automobiles, accessories and machinery, by F. Park, William L. Park and J. Ray Park.

STERLING, ILL.—Charter Gas Engine Co. is having plans prepared by Frank D. Chase, Inc., engineer and architect, 720 North Michigan avenue, Chicago, for a gas engine plant, including machine shop, foundry and warehouse at Sterling.

DES MOINES, IOWA—Brown Camp Hardware Co. has let contracts to Boyd & Moore for constructing a warehouse.

BALTIMORE—Contract for the erection of an $85,000 foundry has been awarded by the Maryland penitentiary. C. B. Sweezey is warden. *Noted Dec. 27.*

BOSTON—The Star Metal Bed Co., Inc., has been formed with $14,000 capital, by Samuel Becker, Israel Young and Samuel Reithman.

SPRINGFIELD, MASS.—The Blair Mfg. Co., manufacturer of lawn mowers, has been incorporated for $100,000 by Phillip N. Case, George A. Gaskill and J. Otis Sibley.

CHARLOTTE, MICH.—Goodrich Mfg. Co. has been incorporated for $50,000 to manufacture and deal in gas motors, electrical appliances, etc., by Max Goodrich, Frank B. Simpson and Joe Powers.

DETROIT—General Electric Co. plans constructing 5-story concrete office and warehouse with service shop adjoining. Building is to cost about $500,000 and be completed next spring.

DETROIT—Chadwick-LeClair Co. has been chartered for $25,000 capital, to deal in machinery and supplies by Charles R. LeClair, 5143 Trumbull avenue, Rose Chadwick and L. W. Chadwick.

DETROIT—Whipple Automatic Tractor & Appliance Co. has been incorporated for $200,000 to manufacture and deal in vehicles and agricultural and mining implements and equipment by Ralph Whipple, 6128 Toledo avenue, William Merithew and Barney Whipple.

JACKSON, MICH.—Orrin Screw Co., 611 Park avenue, has been incorporated for $10,000 to acquire land and buildings for establishing a manufacturing plant to produce metal products, by Carl L. Spengeberg, George E. Schubert and Don T. McKone.

ST. PAUL—The Healy-Ruff Co., Plymouth building, manufacturer of radiator apparatus, has plans for erection of a 1-story foundry at Water and Walter streets, to be used for gray iron castings.

BAYONNE, N. J.—A $500,000 pier will be erected at Constable Hook by the Standard Oil Co. of New Jersey, 26 Broadway, New York.

HOBOKEN, N. J.—Barozzi Dryer Machine Co. has purchased a site, 145 x 115 feet, adjoining the Erie railroad at Eighth and Jackson streets, from the Port of New York Industrial Development Co. A 2-story plant will be constructed.

JERSEY CITY, N. J.—Jersey Rolling Mill Co., has been incorporated for $25,000 to make iron and steel and their products, by Carl G. A. Schumann.

MAPLE SHADE, N. J.—Bids were closed July 15 by the township of Chester on the erection of a waterworks. Remington & Vosbury, Camden, are architects in charge.

NEWARK, N. J.—Interstate Body Corp., has been incorporated for $100,000 to build automobile bodies, by Ames & Crane, Montclair.

NEWARK, N. J.—Approximately $100,000 damage resulted from a recent fire at the plant of the Thatcher Furnace Co. Plans for reconstruction have not been announced.

NEWARK, N. J.—General contract for a $40,000 plant addition has been awarded by the Trenton Malleable Iron Works, to Joseph D. Drugan. The structure will be 70 x 120 feet, 1 story.

BROOKLYN, N. Y.—A $40,000 substation will be erected by the Brooklyn Edison Co. at Pearl and Johnson streets. The structure will be 1-story high, of brick, 100 x 103 feet.

BROOKLYN, N. Y.—Berco Iron Works, has been incorporated for $10,000 by J. Berman, S. and L. Cohen, with M. Krieger, 220 Broadway, New York, as attorney.

BROOKLYN, N. Y.—A $220,000 garage and auto repair shop, will be erected by Thomas P. Graham, on Lefferts avenue, near Schenectady avenue.

BROOKLYN, N. Y.—S. & G. Iron Works, has been incorporated for $10,000 by L. Goldenberg, M. Schacnovsky and S. Stein with Stein & Stein, 305 Broadway, New York, as attorneys.

BROOKLYN, N. Y.—A permit has been acquired by the Brooklyn Edison Co., 380 Pearl street, for the erection of a $45,000 substation at 304-12 that street. The proposed structure will be 1-story high, 100 x 103 feet.

BROOKLYN, N. Y.—Seller Bros. has been incorporated with 100 shares no par value common stock to manufacture hardware, by R. and M. Seller and M. Lepsenter, with A. Durst, 15 William street, as attorney.

BROOKLYN, N. Y.—Steelwood Corp. has been chartered with 100 shares no par value common stock, to manufacture and deal in hardware, by G. A. Cavanagh, E. T. Redlich, and J. Souriran, with L. C. Burdett, 233 Broadway, New York, as attorney.

BUFFALO, N. Y.—Homejoy, has been incorporated for $50,000 to manufacture washing machines, by J. F. Kreger, B. M. Lipowicz and C. Golinski, with A. E. Ruszkiewicz, as attorney.

ELMIRA, N. Y.—The Elmira Water, Light & Railroad Co. is having plans made for a substation in East First street.

LONG ISLAND CITY, N. Y.—A $750,000 service station will be erected at Moore and Honeywell streets by the International Motors Corp., 25 Broadway, New York. E. E. Seelye, 101 Park avenue, New York, is interested.

NEW YORK—Sunray Steel Tool Co. has been incorporated for $50,000 to manufacture tools, by C. and E. Ludwig, and C. W. Gruber, with W. Bruner, 22 Broadway, as attorney.

NEW YORK—Seven-in-One Wrench Corp. has been chartered with $20,000 capital, to manufacture wrenches and other machinery and tools by W. J. Rose, C. April and E. N. Baar, 51 Chambers street, attorney.

NEW YORK—American Register Corp., has been formed with $500,000 capital, to manufacture machinery, by G. W. Vause, J. S. Boyle and H. P. Freece, with Vause & Vause, 42 Broadway, as attorneys.

NEW YORK—Hungerford Brass Corp., has been incorporated for $2,000,000, by E. L. Bennett, C. W. Kosar and C. G. Brooks, with Davis, Wagner, Heater & Horton, 120 Broadway, as attorneys.

NEW YORK—Schaap Durant Control Corp. has been incorporated for $20,000 to manufacture mechanical devices, by R. L. and A. K. Schaap Jr., and J. Boguski, with C. H. Wilson, 1775 Broadway, as attorney.

NEW YORK—Waxman Machine & Motor Co. has been incorporated for $20,000 to manufacture and deal in sewing machines, by A. and B. Waxman and S. E. Ackerman, with H. Ackerman, 1133 Broadway, as attorney.

NEW YORK—Munn & Draper have been incorporated for $50,000 to manufacture stoves and furnaces, by H. A. Munn, W. E. Draper and C. H. Bush, with Sadler & Knemeyer, 44 Court street, Brooklyn, N. Y., as attorneys.

NEW YORK—A site has been purchased by the Brambach Piano Co., on the north side of west Fifty-first street, 150 feet west on Eleventh avenue, for a $750,000, 7-story piano plant. Russell G. Cory, 30 Church street, architect, is preparing plans.

NEW YORK—Chatham Metal Spinning & Stamping Corp., has been incorporated for $60,000 to manufacture and deal in metal products, by T. Layton, I. Rosenthal and J. J. Lazaroe, 25 West Forty-third street, attorney.

NEW YORK—La Mont Waste Heat Steam Generator corp., has been organized with 2500 shares common stock no par value, to manufacture machinery, by M. W. Stoehr, H. V. R. Scheel, and W. I. Lee, with Lee, Smith, Aron & Wise, 7 Dey street, as attorneys.

NEW YORK—Stainless Steel Mfg. Co., has been organized with 200 shares no par value common stock, to manufacture steel products, by S. J. Liebeskind, O. W. McClave and N. B. Rupert, with H. L. Rupert, 1 Madison avenue, as attorney.

NEW YORK—Lightning Mfg. Co. of New York, has been chartered with $5000 capital, to manufacture motors, by E. Copeland, C. A. Winter and S. Friedman. Hartman, Sheridan & Tekulsky, 152 West Forty-second street, are attorneys.

NEW YORK—Fabricord has been chartered with 250 shares $100 par preferred stock and 700 shares no par value common, to build machines for obtaining fiber from vegetable substances. W. S. Savage, L. Hill and L. T. McManus are incorporators, and McKercher & Link, 40 Rector street, are attorneys.

NEW YORK—Work will be started Aug. 1 on a 360,000 square foot factory building for a Manhattan corporation, on a recently purchased site, 200 x 600 feet. The property is bounded by Nott and Anable

avenues, Moore and Honeywell streets, Long Island city. The Cross & Brown Co., 270 Madison avenue, Manhattan, handled the purchase.

SYRACUSE, N. Y.—Leaf Spring & Service Corp. has been incorporated for $6000 to do automobile repair work, by P. A. Hopkins, J. J. McHale, and W. P. Doran, with Jones, Higgins & Tormey, as attorneys.

WATERTOWN, N. Y.—Adams Equipment Co. has been formed with 500 shares $50 par value preferred and 2000 shares no par value common stock, to manufacture machinery and mechanical devices, by J. H. O'Brien, W. M. Hyatt and L. F. Garmsey, with Cobb, Cosgrove & Kimbell, as attorneys.

ALLIANCE, O.—American Railway Express Co. will construct a $30,000 brick freight depot, 135 x 40 feet. It will be equipped with all modern material handling devices.

CINCINNATI—The American Flexible Wheel Co. has been chartered with 2000 shares no par value stock, by Gerson J. Brown, Samuel S. Lord, Edgar S. Freiberg, Howard T. Witherly and John Goldsberry.

CLEVELAND—The Jones Basket Carrier Co. has been incorporated for $30,000 preferred, 600 shares no par value stock, by Walter M. Tobias, B. C. Boer, J. W. Burton, D. C. Janke and L. M. Wyler.

CLEVELAND—The Cleveland Time Switch Mfg. Co. has been incorporated for $2500 to manufacture electrical apparatus, by C. H. Patterson, W. E. Crawford, Fay S. Zimmerman, F. G. Carpenter and M. R. Jordan.

COLUMBUS, O.—Modern Brass Foundry & Mfg. Co. has been incorporated for $50,000 by Leo Gleich, Leo O'Connor, Cecilia Gleich, Clarence H. Gleich and Edward Miller.

LIMA, O.—The Ohio Steam Shovel Co., has been incorporated with 5000 shares no par value stock, by J. E. Galvin and George S. Vail.

SPRINGFIELD, O.—An addition to the foundry of the American Seeding Machine Co. is being constructed for core oven purposes. A 2-story brick building is under construction.

TOLEDO, O.—The Toledo Road Machine Co. has been incorporated with 100 shares no par value common stock, to build machinery, by Peter J. Oswald, Leonard J. Oswald, C. C. Banting, G. F. Wagner and John A. Price.

WOOSTER, O.—Bauer Mfg. Co., manufacturer of ladders, has purchased the building formerly owned by the Canton Rim Co. The building formerly was used by the Fortune Tool Co. Operations are expected to begin in the new plant by the Bauer company before Sept. 1.

SAPULPA, OKLA.—Miller Pump & Boiler Co. recently incorporated with $125,000 capital, plans erecting a plant for the manufacture of pumps and boilers. G. W. Miller, W. A. Wise and H. A. McCauley are incorporators.

TULSA, OKLA.—Slater Bros. Corp., recently chartered with capital of $500,000 expects to erect factory for manufacture of steel rigs, derricks and other oil well supplies. G. P. Slater, H. R. Slater and Remington Rogers are incorporators. *Noted July* 10.

PHILADELPHIA—W. H. Helm will start work at once on the erection of a $25,000 plant at 5231 Filbert street.

PHILADELPHIA—Contract for the erection of a $78,000 warehouse addition for the Frankfort Grocery Co. at the northwest corner of Unity and Penn streets has been awarded to W. E. S. Dyrer, Land Title building.

PHILADELPHIA—Samuel Frank has awarded a contract for the erection of a $15,000 warehouse at the northeast corner of American and York streets, to M. Rosenberg and B. Rotka, 6025 Irving street.

ROYERSFORD, PA.—The Cann & Saul Steel Co., 516 Commerce street, Philadelphia, manufacturer of forgings, pipe flanges, etc., has completed tentative plans for the erection of a $30,000 addition to its plant here.

SUMMERSIDE, R. I.—Town council proposes to erect electric light and power plant here which will be equipped with 2 fuel oil units of 100 horsepower and 200 horsepower respectively; with direct connected 60-cycle generators and exciters.

FORT WORTH, TEX.—Dines Machine Co. has been incorporated for $5000 by A. E. Dines, A. Dines and E. A. Tipton.

ROANOKE, VA.—Roanoke Concrete Pipe Co. has been incorporated with 400 shares no par value common stock and $100,000 preferred stock. G. D. Shipplett, president; C. F. Cocke, secretary, and George S. Shackelford, are incorporators.

ABERDEEN, WASH.—Grays Harbor Railway & Light Co. plans constructing a $500,000 power plant between here and Hoquiam. It will develop 8000 horsepower. Sanderson & Porter, New York and San Francisco, will supervise construction.

KENOSHA, WIS.—The Caldwell Screw Co., Chicago, has asked Conrad Shearer, secretary of the Kenosha Mnufacturers' association, for information concerning this city as a site for its industry, manufacturing wood screws, lag screws and similar products.

RACINE, WIS.—Simms Foundry Corp. is in the market for several square tumbling mills. M. S. Eldred is purchasing agent.

New Trade Publications

WRENCHES—The various features of a special wrench are described in a bulletin issued by the Speednut Wrench Corp., Chicago.

FANS—Man-cooler fans, their application and effects, particularly as applied to workers in steel mills and foundries, are described in an illustrated circular by the Buffalo Forge Co., Buffalo, N. Y.

CAR HOISTS—A portable hoist expediting the lifting of a railroad car for the replacement of wheels or trucks is illustrated and described in a bulletin by the Whiting Corp., Harvey, Ill.

REFRACTORIES—Considerable information dressed in a garment of human interest is presented in the current issue of the Laclede-Christy bulletin, issued by Laclede-Christy, St. Louis. Halftones add to the attractiveness of the issue.

ELECTRIC APPLIANCES—Circuit breakers, precision torsion balances and portable alternating current measuring instruments manufactured by the Roller-Smith Co., New York, are presented in three bulletins being sent out to users of electrical equipment.

EXHAUST FANS—Exhaust fans for use as part of ventilating systems are described in a folder recently issued by the Northern Blower Co., Cleveland. General data are given and the various parts are illustrated. A view of the fan system installed in a plant also is given.

SAND THROWING MACHINE—The Beardsley & Piper Co., Chicago, has issued a 40-page booklet on a sand throwing molding machine. The various molding operations which each type of sand throwing machine will perform are given and the types of machines are described. The booklet is well illustrated with views of the machines in operation and with sectional drawings of the machines.

LADLES—A new catalog of ladles by the Whiting Corp., Harvey, Ill., describes various types and gives tables of standard sizes and a list of repair parts. Both crane and stationary types, helical and worm geared, reservoir ladles and smaller sizes for hand pouring are illustrated.

STEEL TANKS—Containers for storing liquids under or above ground, as manufactured by the Sisterville Tank & Boiler Works, Sisterville, W. Va., are described in two loose-leaf circulars which are of reference value to tank users. Specifications of various sizes guide to the choice of tanks.

ELECTRIC GRINDERS—Electric machines for grinding, buffing and polishing are described and illustrated in a pamphlet issued by the Cleveland Armature Works, Inc., Cleveland. The various features of the machines are shown on section drawings with views of actual installations.

TANKS—Steel and wooden tanks for varied industrial purposes are described and illustrated in a catalog distributed by the W. E. Caldwell Co., Louisville, Ky. Much information as to the proper tank for various purposes and descriptions of accessories are included.

SUPERHEATERS—Discussion of the value of superheat in steam is gone into a booklet prepared by the Superheater Co., New York and Chicago. Various types of such equipment applicable to distinct installations of boilers are described and the product of the company for this purpose is explained.

POWER TRANSMISSION — Transmission of power with chain drive is the subject of a booklet recently published by the Ramsey Chain Co., Inc., Albany, N. Y. The reasons for chain transmission of power and various features of the chain made by that company are described. Specifications of the types of chain are included.

REFRACTORY MATERIALS—The Quigley Furnace Specialties Co., Inc., New York, has issued a bulletin describing a number of successful applications of a refractory material for bonding fire brick and for kindred uses. The use of crushed old fire brick for patching and rebuilding furnace walls is described with correct mixtures indicated.

INDUSTRIAL FURNACE STOKERS—Application of mechanical stokers to heating furnaces in industry is the subject of a catalog by the Sanford Riley Stoker Co., Worcester, Mass. Advantages of stoker firing compared with hand stoking are presented. Details of the construction and operation of the stoker are given, with comparisons of the cost of coal and oil.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	11.00 to 12.00
Boston (dealers)	10.50 to 11.00
Buffalo	14.00 to 15.00
Chicago	15.00 to 15.50
Cleveland	15.25 to 15.50
Cincinnati	12.50 to 13.00
Detroit (dealers)	14.00 to 14.50
Eastern Pennsylvania	15.00 to 16.00
New York (dealers)	11.50 to 12.00
Pittsburgh	17.50 to 18.00
St. Louis	13.50 to 14.00
Valleys	17.00 to 17.50
No. 1 railroad steel New York (dealers)	11.50 to 12.00

COMPRESSED SHEETS

Buffalo	14.00 to 14.50
Chicago	12.00 to 12.50
Cleveland	12.25 to 12.50
Detroit (dealers)	11.50 to 12.00
Pittsburgh	16.00 to 16.50
Valleys	14.50 to 14.75

BUNDLED SHEETS

Buffalo	8.50 to 9.00
Cincinnati	9.00 to 9.50
Cleveland	11.50 to 12.00
Detroit	9.50 to 10.00
Eastern Pennsylvania	13.00 to 13.50
Pittsburgh	14.00 to 14.50
St. Louis	8.50 to 9.00
Valleys	13.00 to 13.25

SHEET CLIPPINGS, LOOSE

Chicago	8.50 to 9.00
Detroit	8.50 to 9.00

STEEL RAILS, SHORT

Birmingham	11.00 to 12.00
Detroit	13.50 to 14.00
Chicago	17.25 to 17.75
Cincinnati	15.50 to 16.00
Cleveland (over 6 ft.)	14.00 to 14.50
St. Louis	16.00 to 16.50

STOVE PLATE

Birmingham	14.00 to 15.00
Boston (consumers)	15.00 to 15.50
Buffalo	15.00 to 15.50
Chicago	16.00 to 16.50
Cincinnati (net tons)	9.50 to 10.00
Cleveland	13.25 to 13.50
Detroit (net ton) dealers	13.00 to 13.50
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	11.50 to 12.00
Pittsburgh	13.50 to 14.00
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo	17.50 to 18.00
Cincinnati	14.00 to 14.50
Eastern Pennsylvania	18.50 to 20.00
Pitts. billet and bloom crops	21.50 to 22.00

SHOVELING STEEL

Chicago	14.75 to 15.25
Pittsburgh	14.00 to 14.50
St. Louis	13.25 to 13.75

KNUCKLES, COUPLERS, SPRINGS

Chicago	18.00 to 18.50
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	20.00 to 20.50
St. Louis	18.00 to 18.50

FROGS, SWITCHES, GUARDS

Chicago	15.25 to 15.75
Eastern Pennsylvania	15.00 to 15.50
St. Louis	14.00 to 14.50

BOILER PLATE, CUT

St. Louis	7.50 to 8.00

ANGLE BARS—STEEL

Chicago	16.50 to 17.00
St. Louis	14.50 to 15.00

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	10.00 to 11.00
Boston (dealers)	13.50 to 14.00
Buffalo	12.50 to 13.00
Cleveland, No. 1	12.00 to 12.50
Chicago, No. 1	14.75 to 15.25
Chicago, No. 2	15.00 to 15.50
Cincinnati, No. 1	11.00 to 11.50
Detroit, No. 2	14.00 to 14.50
Eastern Pennsylvania	18.00 to 18.50
New York, No. 1 (dealers)	15.00 to 15.50
Pittsburgh, No. 1	13.50 to 14.00
Pittsburgh, No. 2	17.50 to 18.00
St. Louis, No. 1	11.00 to 11.50
St. Louis, No. 2	12.75 to 13.25

WROUGHT PIPE

Boston (dealers)	10.00 to 10.50
Buffalo	11.00 to 12.00
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	11.25 to 11.75

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	16.00 to 17.00

CITY WROUGHT

New York, long	13.50 to 14.00

BUSHELING

Buffalo	13.00 to 13.50
Chicago, No. 1	12.50 to 13.00
Chicago, No. 2	8.25 to 8.75
Cincinnati, No. 1	9.00 to 9.50
Cleveland, No. 1	13.50 to 13.75
Cleveland, No. 2	11.00 to 11.50
Detroit, No. 1	11.50 to 12.00
Detroit, No. 1 (new)	10.50 to 11.00
Detroit, No. 2 (old)	9.00 to 9.50
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh, No. 1	13.50 to 14.00
St. Louis, No. 1	12.50 to 13.00

MACHINE SHOP TURNINGS

Birmingham	6.00 to 7.00
Boston (dealers)	7.50 to 8.00
Buffalo	11.00 to 11.50
Chicago	8.50 to 9.00
Cincinnati	9.00 to 9.50
Cleveland	13.25 to 13.50
Detroit (dealers)	10.75 to 11.25
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	8.50 to 9.00
Pittsburgh	13.50 to 14.00
St. Louis	6.50 to 7.00
Valleys	12.00 to 12.50

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	8.00 to 9.00
Boston (chemical)	9.00 to 9.50
Boston (dealers)	8.00 to 8.50
Buffalo	11.00 to 11.50
Chicago	10.50 to 11.00
Cincinnati	9.50 to 10.00
Cleveland	13.75 to 14.00
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania (chem.)	14.50 to 15.00
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	8.50 to 9.00
Pittsburgh	14.00 to 14.50
St. Louis	9.25 to 9.75
Valleys	13.75 to 14.25

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	6.50 to 7.00
Cleveland	13.75 to 14.25
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania	11.00 to 11.50
New York (dealers)	7.00 to 7.50

IRON AXLES

Birmingham	18.00 to 19.00
Boston (consumers)	31.00 to 32.00
Buffalo	25.00
Chicago	26.50 to 27.00
Cincinnati	18.50 to 19.00
St. Louis	25.00 to 25.50
New York (dealers)	23.00 to 24.00
Eastern Pennsylvania	21.50 to 22.50

IRON RAILS

Buffalo	19.00 to 20.00
Chicago	17.50 to 18.00
Cincinnati	11.50 to 12.00
St. Louis	10.50 to 11.00

PIPES AND FLUES

Chicago	10.00 to 10.50
Cincinnati	9.00 to 9.50
Cleveland	10.25 to 10.50
St. Louis	8.00 to 8.50

RAILROAD GRATE BARS

Buffalo	14.50 to 15.00
Chicago	16.00 to 16.50
Cleveland	13.75 to 14.00
Eastern Pennsylvania	14.50 to 15.00
New York (dealers)	12.50 to 13.00
St. Louis	14.00 to 14.50

FORGE FLASHINGS

Boston (dealers)	8.00 to 8.50
Buffalo	12.00 to 12.50
Chicago	10.50 to 11.00
Cleveland (under 10 in.)	12.75 to 13.00
Cleveland (over 10 in.)	11.50 to 12.00
Detroit (dealers)	10.00 to 10.50

FORGE SCRAP

Boston (dealers)	8.00 to 8.50
Chicago	18.00 to 18.50
Eastern Pennsylvania	13.25 to 13.75

ARCH BARS AND TRANSOMS

Chicago	19.00 to 19.50
St. Louis	18.00 to 18.50

ANGLE BARS—IRON

Chicago	17.50 to 18.00
St. Louis	17.00 to 17.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	8.00 to 8.50
Buffalo	14.50 to 15.00
Chicago	12.50 to 13.00
Cleveland	14.00 to 14.25
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh	16.00 to 16.50
St. Louis	10.00 to 10.50

STEEL CAR AXLES

Birmingham	17.00 to 18.00
Boston (consumers)	19.00 to 20.00
Buffalo	19.00 to 20.00
Chicago	19.50 to 20.00
Cleveland	17.75 to 18.25
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	20.00 to 20.50
St. Louis	18.50 to 19.00

SHAFTING

Boston (consumers)	19.00 to 20.00
Chicago	19.50 to 20.00
Eastern Pennsylvania	22.00 to 24.00
New York (dealers)	17.00 to 17.50
St. Louis	19.00 to 19.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	15.00 to 16.00
Birmingham, iron	14.00 to 15.00
Boston (consumers)	19.00 to 19.50
Buffalo	17.50 to 18.00
Chicago, iron	16.50 to 17.00
Cincinnati	11.00 to 11.50
Eastern Pennsylvania	17.50 to 18.00
New York iron (dealers)	14.50 to 15.00
Pittsburgh, iron	16.50 to 17.00
Pittsburgh, steel	20.00 to 20.50
St. Louis, iron	15.00 to 15.50

NO. 1 CAST SCRAP

Birmingham, cupola	15.00 to 16.00
Boston (consumers)	19.50 to 20.00
Buffalo	16.00 to 16.50
Chicago, No. 1 machinery	18.75 to 19.25
Cincinnati No. 1 machinery cupola (net tons)	16.00 to 16.50
Cleveland, cupola	18.50 to 18.75
Detroit (net tons) (dealers)	16.00 to 16.50
Eastern Pennsylvania, cupola	17.50 to 18.50
New York, cupola (dealers)	14.00 to 14.50
Pittsburgh, cupola	17.50 to 18.00
San Francisco	20.00
St. Louis railroad	18.50 to 19.00
St. Louis, agricultural	18.50 to 19.00
Valleys	19.50 to 20.00

HEAVY CAST

Boston (consumers)	15.50 to 16.00
Buffalo (breakable)	15.00 to 15.50
Cleveland	12.50 to 13.00
Detroit (automobile) (net ton)	16.50 to 17.00
Eastern Pennsylvania	16.00
New Yorkk (dealers)	12.50 to 13.00
Pittsburgh	15.50 to 16.00

MALLEABLE

Boston (railroad)	18.00 to 18.50
Buffalo	17.50 to 18.00
Chicago, railroad	17.50 to 18.00
Chicago, agricultural	17.00 to 17.50
Cincinnati, agricultural	11.50 to 12.00
Cincinnati, railroad	14.50 to 15.00
Cleveland, agricultural	16.25 to 16.50
Cleveland, railroad	17.25 to 17.50
Detroit (dealers)	16.50 to 17.50
Eastern Pennsylvania, railroad	15.50 to 16.50
Pittsburgh, railroad	15.50 to 16.00
St. Louis, agricultural	13.00 to 13.50
St. Louis, railroad	13.25 to 13.75

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham, tram car	14.50 to 15.00
Boston (dealers)	12.00 to 13.00
Chicago	16.00 to 16.50
Cleveland	15.50 to 16.00
Detroit	13.50 to 14.00
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.00 to 14.50
Pittsburgh district	18.00 to 18.50
St. Louis	15.00 to 15.50

LOCOMOTIVE TIRES

Chicago	18.00 to 18.50
St. Louis	14.50 to 15.00

LOW PHOSPHORUS PUNCHINGS

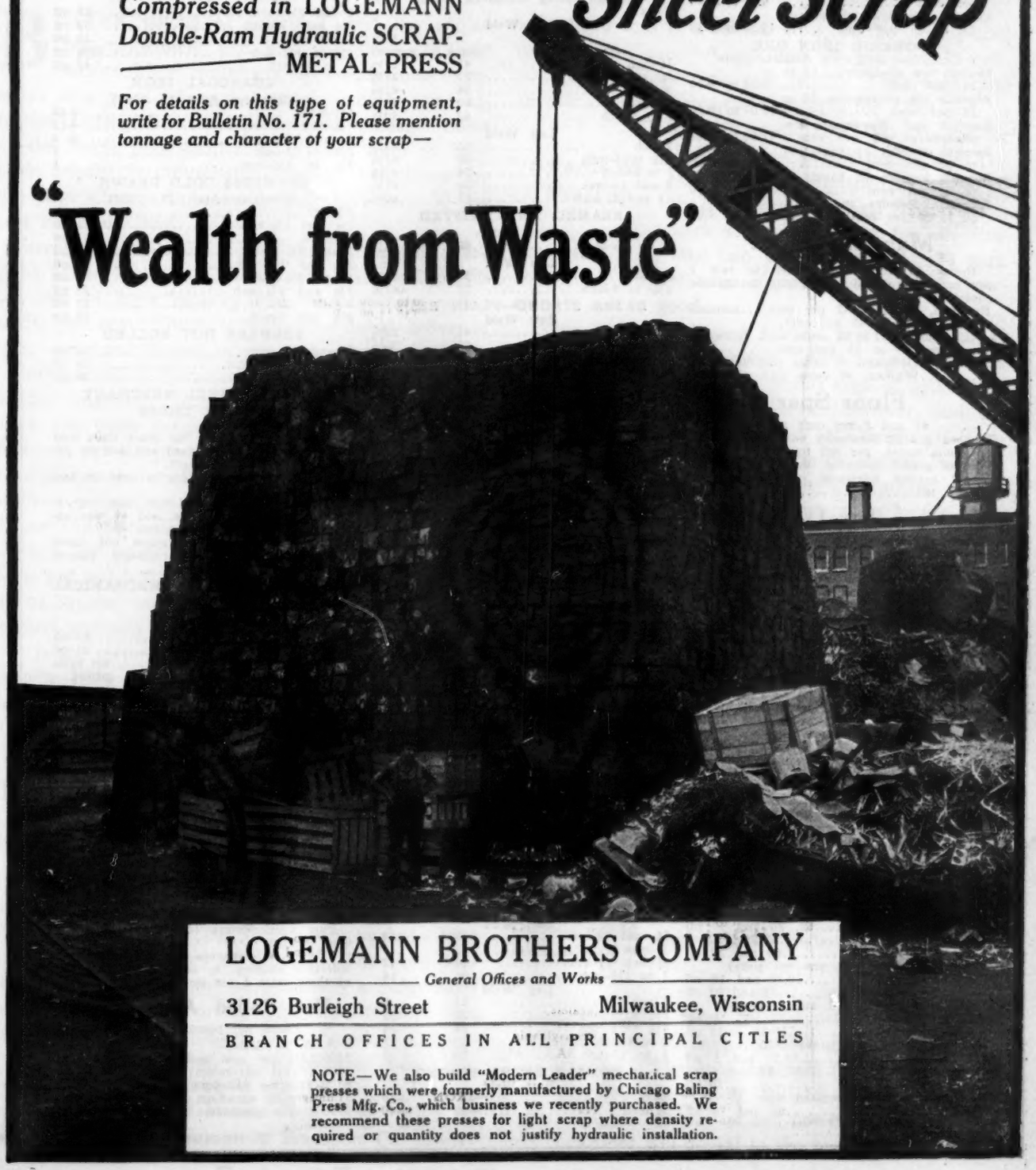
Chicago	15.50 to 16.00
Eastern Pennsylvania	18.00 to 19.00
Pittsburgh	20.00 to 20.50

Almost 2000 Tons - of "LOGEMANN HYDRAULIC-COMPRESSED" Sheet Scrap

Compressed in LOGEMANN *Double-Ram Hydraulic* SCRAP-METAL PRESS

For details on this type of equipment, write for Bulletin No. 171. Please mention tonnage and character of your scrap—

"Wealth from Waste"



LOGEMANN BROTHERS COMPANY

General Offices and Works

3126 Burleigh Street Milwaukee, Wisconsin

BRANCH OFFICES IN ALL PRINCIPAL CITIES

NOTE—We also build "Modern Leader" mechanical scrap presses which were formerly manufactured by Chicago Baling Press Mfg. Co., which business we recently purchased. We recommend these presses for light scrap where density required or quantity does not justify hydraulic installation.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron..$5.65
Mesabi bessemer, 55 per cent iron.... 5.40
Old Range nonbessemer, 51½ per cent iron 4.90
Mesabi nonbessemer, 51½ per cent iron 4.75

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent ..... 9.00 to 10.00
Copper free low phosphorus 53 to 65 per cent ..... 12.50 to 13.50

FOREIGN IRON ORE

Cents per unt, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent ..... 9.00 to 9.50
Algerian low phosphorus, 52 to 54 per cent ..... 10.00 to 10.50
Swedish and Norwegian low phosphorus, 68 per cent.. 11.00 to 11.50
Swedish foundry or basic, 66 to 68 per cent ..... 9.00 to 10.00
Spanish foundry or basic, 50 to 54 per cent ..... 8.00 to 9.00
Alegerian foundry and basic, 50 to 54 per cent ..... 8.00 to 9.00

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent....nominal
Indian, minimum 47 per cent.....
....nominal 41 to 42 cents c.i.f. tidewater
Caucasian, 53 to 55 per cent.....
.....Ordinary, 43 cents c.i.f. tidewater
.....Washed, 46 cents c.i.f. tidewater

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton $19.00 to 23.50
Washed gravel, imported duty paid eastern tidewater, per net ton..... 19.00

Rivets

Structural rivets, C. L. Pitts.. 2.45c to 2.50c
Structural rivets L. C. L. Pittsburgh ..... 2.65c to 2.75c
Rivets, 7/16-in. and smaller.....
.....70 and 10 off to 70, 10 and 10 off

Nuts and Bolts

(Up to 1¾ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank .....$5.00 to 4.75 off list
Hot pressed square or hexagon tapped .....$5.00 to 4.75 off list
Cold punched square or hexagon blank .....$4.50 to 4.25 off list
Cold punched square or hexagon.... .....$4.50 to 4.25 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger .....80 and 10 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller ....80, 10 and 5 off
Price f.o.b. Pittsburgh, packages of 50.

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread .....60 and 20 off
Cut thread .....60 and 10 off
Larger and longer .....60 and 10 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread .....60, 20 and 10 off
Cut thread .....60 and 20 off
Larger and longer .....60 and 20 off
(All sizes cold punched nuts)
Cut thread .....50,10 and 10 off
Lag screws .....65 and 20 off
Plow bolts Nos. 1, 2 and 3 heads.. .....50 and 10 off
4 to 10 heads.....50-10 + 20 off
Flat and round head stove bolts..... .....80,10 and 5 off
Other stove bolts .....80, 10 and 5 off
Tap bolts .....30 off
Bolt ends with hot pressed nuts..... .....60 and 20 off
Bolt ends with cold punched nuts.... .....50, 10 and 10 off
Blank bolts .....60 and 20 off
Rough stud bolts with nuts (250 pieces or more of a size)..... ....45, 10 and 5 off

Washers

Wrought .....$5.75 to $6.10 off
Lock washers .....80 per cent off

Steel Pipe

(Effective April 19, 1923)

Pittsburgh basing discounts, jobbers' carloads.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	43	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)

Pittsburgh basing discounts, jobbers' carloads

THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENLS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap Welded)

(Effective April 19, 1923)

2 and 2¼-inch ..... 23 off
2½ and 2¾-inch ..... 33 off
3-inch ..... 36 off
3¼ to 3¾-inch .....38½ off
4 to 13-inch ..... 42 off

CHARCOAL IRON

(Effective April 12, 1923)

1½-inch ..... +22
1¾-inch ..... +12
2 and 2¼-inch..... + 2
2½ to 3-inch 3
3¼ to 4½-inch..... 5

SEAMLESS COLD DRAWN

(Effective April 19, 1923)

1-inch ..... 51 off
1¼ and 1½-inch ..... 43 off
1¾-inch ..... 27 off
2 and 2¼-inch ..... 18 off
2½ and 2¾-inch..... 28 off
3 and 3¼-inch ..... 32 off
3½ and 3¾-inch ..... 33 off
4-inch ..... 37 off
4½ and 5-inch..... 29 off

SEAMLES HOT ROLLED

3 and 3¼-inch ..... 34 off
3½ and 3¾-inch..... 35 off
4-inch ..... 39 off

SEAMLES STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent..... 83 off
Carbon, 0.30 to 0.40 per cent..... 81 off
Carbon 0.40 to 0.50 per cent.....net price
Plus differentials and extras for cutting.

SEAMLES STEEL LOCOMOTIVE AND SUPERHEATER TUBES

(Effective April 19, 1923)

Outside diameter	Gage	Net prices jer foot f.o.b. Pittsburgh Price
2-inch	12-gage	15c
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5⅜-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

*Published discounts are subject to considerable shading, in some cases as much as three extra 5 per cents.

Hot Rolled Alloy Steels

Prices per pound, Pitstburgh

S. A. E. Series—
2300 (3½ per cent nickel)... 5.00c
3100 (nickel chromium)..... 4.00c
6100 (chrome vanadium) 4.75c
6100 (chrome vanadium spring) 4.50c
9250 (Silico manganese spring) 4.00c to 4.25c